REPORT

ON THE

ADMINISTRATION

OF

THE FOREST DEPARTMENT

IN THE

SEVERAL PROVINCES UNDER THE GOVERNMENT OF INDIA,

1870-71.

WITH

APPENDICES.

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CALCUTTA:
OFFICE OF THE SUPERINTENDENT OF GOVERNMENT PRINTING.
1872.

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PART I.

INTRODUCTORY.

1. THE State forests under the control and administration of the Government of India are those of Bengal, the North-West Provinces, the Panjáb, Oudh, the Central Provinces, Mysor, Khurg and the Assigned Districts of Berar (Haidarabad). They comprise three main divisions or classes, *viz.*—1*st*, Reserved forests, or those under the exclusive management of the Forest Department; 2*ndly*, Unreserved or open forests, generally under the management of the local district officers; and 3*rdly*, Plantations. The same description of forests have not in all provinces fallen under the same category—a fact which is to be ascribed to the recent date of the formation of a Forest Department, and a consequent want of uniformity in the systems of the officers, and in the methods of work. Generally speaking, however, the first class, or Reserved forests, are those in which the State has absolute right of possession, the rights of all others being excluded; while in the second class, or Unreserved forests, the rights of the agricultural community, and others, to wood and pasturage, are either admitted or allowed by sufferance. In some provinces the work of demarcation has been carefully and completely carried out by the erection of pillars, cutting broad roadways, or clearing lines through the jungle; while in others, certain great natural landmarks of the country have been taken as boundary marks, and all within these has been designated as Reserves. The following table gives, as accurately as can be ascertained, a return of the area of the Reserved and Unreserved forests, and shows at the same time the number of population whose wants the forests of each province are called upon to supply; the area cultivated, culturable, and uncultivated, is also shown. The third class, or Plantations, conveys its object in its name, and requires no further explanation.

Statement of Forest Lands, as compared with total area and population of Provinces under the Government of India.

Name of Province.	Cultivated area.	Culturable waste.	Unculturable waste.	Total.	Population.	Forest land.	Reserved Forests	Private and Unreserved Forests	PLANTATIONS	
	Square miles.	Square miles.	Square miles.	Square miles.		Square miles.	Square miles.	Square miles.		Acres
Bengal ...	99,525	56,550	63,650	2,19,725	50,000,000	59,225	1,546	57,679	Mixed	412
N. W. Provinces	37,596	11,844	26,451	75,891	30,086,898	4,385	2,213	2,172	Australian ...	45
Panjáb ...	31,513	25,333	45,155	1,02,001	17,596,752	2,990	2,404	586	Mixed Fuel and Timber	11,643
Oudh... ...	12,985	6,577	4,168	23,730	11,220,747	1,936	735	1,201	Bamboo and Bissoo	90
Central Provinces	23,281	27,246	33,479	84,006	7,985,411	29,167	1,741	27,426	Teak ..	162
Burma ...	3,105	35,113	55,665	93,883	2,463,484	7,000	131	6,869	Teak .	1,648
Mysor ...	9,019	4 600	16,098	29,717	4,273,544	398	247	151	Teak Sandal .. Fuel .	123 368 180
Khurg ...	547	10,705	148	11,400	111,830	374	...	...	Teak . Sandal ...	300 600
Berar ...	8,310	5,240	4,550	18,100	2,231,565	2,098	781	1,317	Teak ..	38
Total ...	2,25,881	1,83,208	3,49,364	6,58,453	1,25,970,231	1,07,573	9,798	97,401		15,609

NOTE.

Bengal.—The figures are only estimates. The Officiating Secretary writes as follows:—"There are absolutely no statistics of this kind for Bengal. The total area has "been variously stated by many authorities at anything between 800,000 and 150,000 "square miles. No human being knows the proportion of cultivated, culturable, &c." He then adds his own calculations, which are most carefully made, and are given in the above table. He calls them guesses, but adds—"there are no materials for a better guess." The Bengal Reports for 1869-70 and 1870-71 give the Reserved forests as stated above, but besides these it is stated "there are enormous areas of forest not yet mapped.,,

North-West Provinces.—The *chir* forests of Kamaon, not now under the Forest Department, amount to 1,074 square miles. The *sâl* forests to 622 square miles The Garhwal Reserved *sâl* forests are now being surveyed; their area is about 1,000 square miles. Those of the Dún are about 450 square miles. The Bhagirati *deodar* forests (which have been surveyed) contain 11,490 acres or about 18 square miles. The Tonse forests are not yet surveyed, but contain about 600 square miles, and the Gorakhpur forests about 123 square miles. In Jhansi the forests, extending over about 298 square miles, are under the district officers, as also are the Rohilkand forests, covering about 200 square miles.

Panjáb.—In the area of Reserved forests is included the area of the leased forests of Chamba and Basahir, and the Rakhs, or forests in the plains.

Oudh.—In Oudh there are 721 square miles of groves, and 480 square miles of private Forests (Report for 1868-69), the former being nearly equal in area to the State forest reserves.

Mysor.—The State forests are 398 square miles in extent, of which 45 square miles are evergreen forests, the boundaries of which are naturally marked.

Berar.—There are 11,240 acres, or 17 square miles of *babúl* buns, or rakhs, in the plains, and 1,300 square miles of Unreserved forests (including the Amráoti fuel reserve) under district officers, besides the Reserved State forests (paras. 131 to 139 of Report for 1870-71.)

BENGAL.

General position of the Bengal Forests.

2. In this province the principal forests are situated in Sikkim (Kuch-Behar), Bhútan, Assam, Cachar and Silhet, and Chota Nágpur. The Sikkim forests divide themselves into the two classes of temperate and tropical, the former lying on the Himalayan range at an elevation of from 6,000 to 8,600 feet, and the latter along the Tista river, among the outer hills, and in the Terai, at elevations not exceeding 3,000 feet. In the higher forests grow *chestnut, oak, walnut, cherry, magnolias*, &c.; the lower consist chiefly of *sál* and *sissú*. In the Bhútan Sub-division, *sissú* occupies about half the complete area of the forests. In Assam the forests are very extensive on both sides of the Brahmapútra, in the hills as well as in the plains; here we meet with the *caoutchouc*, and with forests of *súm* trees, on which the silk-worms feed. To the south of the Brahmapútra, the Lakhimpur forests cover the district where the ground has not been cleared for tea plantations; there the trees are all of the kind which yield hard and heavy woods, such as *sál*, *cham*, and *sissú*. In Cachar and Silhet, the area of the forests is estimated at 2,000 square miles; this is exclusive of the Lushai country, in which the best forests exist: these are as yet however unexplored. Chittagong contains an estimated area of 3,500 square miles of forest, in which the most valuable trees are *ironwood* and *tún*. *Sál* is the prevailing tree in the forests of Chota Nágpur, Singbhúm, Palámau, Bhágalpur, the Santhal Pargana and in the Tributary Mahals of Orissa. There are, too, tracts of *teak* on the Mahanaddi, but the area of ground so covered is not yet ascertained. The Sunderbuns contain also a large area of Government forest and jungle land.

Principal districts and towns, and the sources from whence they draw their wood supply.

3. The upper districts of Bengal are chiefly supplied with *sál* timber from Nipal, a small proportion coming from Oudh and Gorakhpur. There are no indigenous supplies worth mentioning, except *mango-wood* from Tirhút, which, for the making of opium boxes, is now being largely used in the factory at Patna. The eastern districts, Assam, Dacca, and Chittagong, are able to supply themselves from local sources, but it is a curious fact that these extensive forests do not seem able to furnish a sufficiency of wood fitted to make boxes for the tea so largely grown there, such wood being imported from Burma.

Calcutta timber market.

4. The Calcutta timber market is supplied with *teak* from Maulmain and Rangoon; *Johor teak* from Singapur; mast-pieces and poles from America as well as with *mahogany*, and the Australian timbers. From 7,000 to 10,000 tons of *teak* are generally available, at prices varying from Rs. 40 to Rs. 110 per ton, according to quality; *Johor teak* at Rs. 40 to 55 per ton; American mast-pieces at Rs. 5 per running foot; and Australian timbers at about Rs. 50 per ton. The *tún* timber formerly exported from Chittagong is now nearly exhausted, but the term of "Chittagong wood" is very generally applied to several kinds of wood exported thence.

THE NORTH-WEST PROVINCES.

Number of population and cultivated area compared with the forests.

5. The forests of the North-West Provinces cannot be accurately estimated, the maps now in progress in the Surveyor General's Department not being yet completed. Approximately they may be stated as follows:—

Forests in the Plains.

Garhwal Reserved *Sál* Forests ...	1,000	sqr.	miles.
Kamaon *Chir* Forests	1,074	„	„
Kamaon *sál* Forests	622	„	„
Dehra Dún and Siwaliks, about	450	„	„
Jhansi Division (surveyed), about	298	„	„
Gorakhpur Division	123	„	„
Rohilkand	200	„	„

Hill Forests.

Jaunsar Forests	600	sqr.	miles.
Bhagirati Forests (surveyed), about	18	„	„
TOTAL ...	4,385	„	„

As compared with the population and the cultivated area of the North-West, its forests bear a very low proportion. On the other hand, they are valuable; and the principal forests being situated near the many rivers which run down from the Himalayas to the plains, their timber is brought to market without any great additional expense.

Description and general position of the forests.

6. A reference to the map accompanying this report will show that, with the exception of those in the Jhansi Division, the North-West forests lie exclusively either within the Himalayan ranges, or immediately at their foot. In the hills of Kamaon and Garhwal the characteristic tree is the chir (*Pinus longifolia*), which is found almost everywhere at an elevation of from 3,000 to 8,000 feet. In the higher ranges chil (*P. excelsa*) and Cyprus (*Cupressus torulosa*) are to be met with, as well as the pencil cedar (*Juniperus dilata*). But there is very little *deodar*, and that little is unavailable for the general market, either from its inaccessibility of position, as in the forest on the Dauli below the Niti Pass, or from its being barely sufficient for local purposes, as in the small groves (probably not indigenous) which lie east of Almora in the Lohaghat District. Below the Kamaon and Garhwal Hills and stretching up into the lower ranges, lie the great *sâl* and *bamboo* forests of the North-West. Though considerably worked in past years, these forests still contain a fair amount of mature timber, chiefly in the neighbourhood of the Kosi and Ramganga rivers. West of the Ganges, in the Dún, *sâl* is the characteristic tree. But the forests which have been pillaged for years by the Mirat traders, and ravaged by fire and cattle, now contain no timber whatever of size larger than that of mere poles. In the Dún certain descriptions of *acacia* grow in considerable abundance, which furnish large quantities of wood for sugar-mills and other agricultural purposes. Many millions of bamboos also are annually exported down the Ganges from the whole range of lower hills in its neighbourhood. North of Dehra, near the sources of the rivers Ganges and Tonse, lie the *deodar* forests of Gangútri and Jaunsar, the former, besides *deodar*, containing much *cyprus*, *P. excelsa*, *P. longifolia*, and *birch*.

7. East of the Sarda, and still along the foot of the Himalayas, lie the forests of Nipal with those of Oudh below them; beyond which again are a part of the North-West forests in Gorakhpur. Here *sâl* again is found to be the characteristic tree, but mixed with large quantities of *Terminalias*, *Ebony*, and *Acacias*. Situated as the Gorakhpur forests are, on the margin of a highly cultivated and thickly populated country, there is no timber whatever left in them. The forests are mere coppices of *sâl* poles now almost exhausted, and it is very doubtful whether they could ever be restored sufficiently to produce large timber.

8. The Jhansi forests are mere jungles, and it is probable that in their best days they produced timber of no great size, except in a few favorable localities. In the south of Lallatpur, bordering on the Súgar District, there is a good deal of small *teak*; but the *teak* tree does not seem generally to thrive well so far north of the Narbada, nor to attain any great size. The forests themselves

are too far removed from any of the great lines of export, either by rail or river, to be of much value in a financial point of view.

Principal districts and towns, and the sources from whence they draw their supply of wood.

9. Mirat, Agra, Bareli, Allahabad, including Cawnpur and Benares, are all principal centres of population in the North-West Provinces, and are also the places of residence of the chief officers to whom the management of the great civil divisions of the country is entrusted. Throughout this wide range nothing worth the name of timber grows, the consequence being that the dwelling places of the rural population are of miserable size. Even in large towns the houses are but little better, for, on account of the distance of the forests, timber and bamboos are exceedingly expensive, and are employed as sparingly as possible. The portion of the country north and west of Cawnpur is mainly supplied from the forests of Kamaon and Garhwal, and from the Dún; but below Cawnpur the Nipal timber, brought down the Ganges from Biramghat on the Sarda, has the command of the market. Patna, and the surrounding country, is supplied with small wood from Gorakhpur, and with large timber from the Eastern Forests of Nipal. The Jhansi district, which lies south of the Jumna, is able to supply itself with wood, but can make no export. For large buildings it draws a small supply of *sál* from the Cawnpur market.

10. In the Mirat and Bareli Divisions, where the supply is tolerably regular, *sál* in small scantlings fetches about Re. 1-8 per cubic foot of sawn timber; at Cawnpur, Agra, and Fathigarh, where the supply is more uncertain, the price ranges from Re. 1-4 to Rs. 2. In the lower parts of the province large timber is seldom used, except for public buildings, but small pieces are cheaper on account of the proximity of the Gorakhpur forests, and the price varies from 12 annas to 1 rupee for poles and pieces of about one cubic foot. The price of bamboos varies according to the distance of the points of supply from the forests, but at Allahabad, which may be considered an average centre of supply, they range from Rs. 2-8 to Rs. 5 per hundred.

State Railways and their timber supply.

11. The Rajputana State Railway, now under construction, which will run from Dehli and Agra to the Sambhar Lake, draws its principal supply of sleepers from the North-West *Deodar* forests. Its total length, as at present sanctioned, is about 400 miles, for which 8,00,000 of sleepers are ordered; of this number, 1,20,000 are required at Dehli, and the remainder at Agra; about 84,000 have been already delivered at Dehli, and 1,50,000 more are lying sawn up in the Tonse forests ready to be floated down in the spring, when the melting of the snow has filled the river. Timber for 2,00,000 more from the Bhagirati forests is now in the Dún, which will be sawn up, and the sleepers sent to Agra during the present cold weather. The timber for the remainder is already felled, and the Forest Department expect to deliver 3,00,000 sleepers (half coming from the Tonse forests, and the other half from those of the Bhagirati) in 1872-73. The balance, or about 1,25,000, will probably be supplied from the *Sál* forests of Kamaon and Garhwal, where 80,000 sleepers are now being cut up for this season's supply.

Cost of the sleepers.

12. The actual cost to the Department of the large sized sleepers, delivered at Dehli from the Bhagirati, has been Rs. 3-9-6 each, which sum includes, besides canal dues, the cost of floating them down from Hardwar to Murádnagar, and cartage thence to Dehli. On the Tonse, owing to the fact that all the work has been done departmentally, it is at present very difficult accurately to separate the accounts of works completed from those still in progress. Roughly, however, Rs. 70,000 were expended on 23,000 sleepers, 4,000 of which have arrived at Dehli, the remainder being still in

the canal on their way down from the foot of the hills. The price of the Tonse sleepers will therefore be much the same as those of the Bhagirati, where the timber operations have been carried on by contract with Mr. Wilson, subject to the supervision of the Forest Department, both being approximately at the rate of one rupee per cubic foot of prepared timber.

13. The *Sál* sleepers from Kamaòn and Garhwal, which are of the reduced size, *viz.*, 6′ × 8″ × 4″, or about 1·3 cubic feet each, will cost at the depôts outside the forest Re. 1-2 per sleeper, to which one rupee each must be added for conveyance to Agra. In the above calculation nothing is allowed for royalty or cost of timber in the forest, the rates of charge being still under the consideration of Government. The small sized *Deodar* sleepers will probably cost about Rs. 2-4 at Dehli, and Rs. 2-7 at Agra; but they have not yet been prepared in sufficient numbers to enable the Department to judge with certainty of their cost. At present, however, the rates charged by the Canal Department, which form no small item in the total cost of a sleeper, is the same for all sizes.

The Dehra Dún—its peculiar position in regard to its forests.

14. The Dún has probably for centuries been the main source from which the fertile districts of the Upper Doab of the Ganges and Jumna have drawn their supply of wood. Its forests have, for this reason, been felled and re-felled, until, in spite of the great natural advantages they possess, they are thoroughly worn out. Within the last thirty years, the advantages of soil and climate have attracted settlers to this favored spot, and grants of land having been readily conceded by Government at moderate rates, large portions of the valley are now private property. Upwards of ninety grants of land have been made to private parties in the Dún, many of which have been taken up solely on account of their value, in a forest point of view. The boundaries of these properties march with those of the Government forests, with which they are everywhere intermingled.

Frauds on the Forest Department in the Dún.

15. This intermingling of boundaries has led to much fraud in the Government forests, the difficulty of protecting which is proportionately increased. It is of course impossible to prevent export from the private forests, and frauds of all kinds have been practised through the corruption of the native subordinates of the Government Forest Department. The practice of the traders appears to have been to make use of rawanas or passes, obtained from the grantees, to pass timber (which had been cut within the Government boundaries) free of duty through the forest posts; in this way, hundreds of thousands of poles, scantlings, pieces for sugar-mills, and bamboos were annually stolen and exported down the Ganges and Jumna.

Exertions to check the same.

16. Great exertions have been made by Government during the past year to put down these fraudulent practices. A specially qualified Civilian was employed to act as prosecutor, and to aid the Forest Divisional Officer in establishing the guilt of the suspected parties. The Head Múnshi of the Dehra Forest Office, currently believed to have been at the head of a fraternity of Government servants, who formed a sort of joint-stock company to trade in Government timber, was brought to trial, as well as the Múnshi in charge of the Hardwar Depôt, and several other minor officials.

Failure of justice, and cause to which it must be attributed.

17. In all these cases convictions were obtained before the Magistrate, and though the defendants had the benefit of the best legal advice, severe sentences of imprisonment, with heavy fines, were pronounced against the offenders. The cases, however, were carried for appeal to the Sessions Judge at Saharanpur, and it is a matter of serious regret that this officer (who has since resigned)

either reversed all the sentences, or so reduced the punishments inflicted, as to completely nullify their deterrent effect. The Government forests are now all being demarcated, and, where it is possible, fenced in, so as to render theft more difficult; but the failure of justice on the old offenders is greatly to be deplored, both on account of its moral effect on the Native subordinates, and for the serious loss of valuable time devoted by the Government officers to the prosecutions, greatly of course to the detriment of other work.

Forests leased by the State in the North-West Provinces.

18. The Tehri Rajah's forests, which include the whole of the Gangútri *deodar* forests, as well as those of the Upper Tonse, above its junction with the Pábar, are held by Government on a lease for 20 years, renewable at pleasure. The annual sum paid to the Rajah is Rs. 10,000. In these forests the people retain certain rights of grazing, &c., but no *deodar* trees can be cut without an order from the forest officer of the British Government in charge. The Basahir forests on the Pábar and Rupin rivers (tributaries of the Tonse), of which the Panjáb Government holds the lease, are also made over to the Forest Department of the North-West Provinces to be worked.

THE PANJÁB.

19. (I am indebted to Mr. Powell, the Officiating Conservator in the Panjáb, for a most valuable and interesting description of its forests, which is published *in extenso* in Appendix A. I shall give only a short epitome of the same in the body of the Review).

General position of the Panjab forests.

20. The principal forests in the Panjáb consist of the *Deodar* forests of the Satlaj, Bias, Parbatti, Ravi, Chinab, Jhilam, and their tributaries; the *Chil* forests in Kangra—Gúrdaspur; forests of *Pinus Excelsa* in Hazara; and the Rakhs of Ráwal Pindi and the Central and Southern Panjáb, which contain various species of gnarled and knotty trees,* often of considerable size, but only in exceptional cases fit for timber.

21. Besides the above may be cited the *Silver Fir*, *Spruce*, *Pencil Cedar*, and *Edible Pine* forests of the higher Himalayan Ranges, and the *Oak* forests which cover the whole montane tract below the snow, also the *Sál* forest of Kalisar on the Jumna (which however now produces only wood for roofing, poles, and fuel), and the Kachhi *Shisham* forests on the Indus. Besides these there are the artificial plantations.

Principal districts and towns, and the sources from whence they draw their wood supply.

22. There are thirty-two districts in the Panjáb, and in most of these the principle was adopted at the settlement of leaving for every village a portion of waste area equal to twice or thrice the cultivated area, as circumstances seemed to require. Hence nearly all the supplies for towns and villages are derived from waste or rakh lands, at greater or less distances, which produce stunted trees and brushwood suitable for fuel.

23. The cantonments and large cities alone need special reference. Peshawar, Abbottabad, Kohat, and Banú derive their supplies of small wood and fuel from the undemarcated and practically unknown jungles in their neighbourhood. It is brought in by the frontier tribes, and at present there appears to be an abundant supply. There are large areas of rakh land also near Dera Ismail Khan and Dera Gházi Khan, from which those cities and cantonments obtain all that they want. At Ráwal Pindi, before long, there will

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* The Northern Rakhs chiefly contain *Phulahi (A. Modesta)*, *Kas (olive)*, *Sanatta (D. Burmauniana)*, *Pataki (Gymno sporia spinosa)*, and *Karil (Capparis aphylla)*. The Central Rakhs contain *Kikar (A. Arabica)*, *Jhand (Prosopis Specigera)*, *Karil—Pilil (Salvadora oleoides)*, *Bér (Zizyphus)*, also *Dhak (Butea frondosa.)*

In the Southern Rakhs many of the same species occur, with *Rerú (A. Leucophloea)*, *Báhn (Populus Euphratica)*, and *Tumarisk*.

be great difficulty in meeting the supply, but the forests are just now being brought under systematic management. Marri, Jhilam, and Shahpur are all locally supplied. Lahor derives its supply of timber from the Ravi depôts, and fuel from Government and communal rakhs or waste lands. Amritsar obtains timber from both the Bias and Ravi depôts, and for fuel depends chiefly on private rakhs in Amritsar, and on the neighbouring districts of Hushiarpur and Gurdaspur. The cities of Ferozpur, Jallandar, Phillor, Ludhiana, Hushiarpur, Kangra, and Madhopur have all local sources of supply, or obtain what they require from the rivers which flow past them. Amballa is supplied from the lower hills which skirt the district. Jagadri and Ropar are supplied in the same way. Dehli draws its fuel partly from waste lands belonging to private persons, and partly from the forests of the North-West Provinces. Near Rohtak, Sirsa, Hansi, and other towns of the Hissar Division, there are vast areas of waste land from which they derive their supply of fuel.

Forests leased by the State.

24. The forests of the Chamba and Basahir States are both leased by the British Government, and are managed by the Panjáb Forest Department. The Chamba Forests are situated on the Ravi and Chinab rivers and their tributaries. They consist mainly of *Deodar*, mixed with other *pines*, and with deciduous trees, and are situated from 5,000 to 8,500 or 9,000 feet above the sea, on slopes averaging from 25° to 30°.

25. The Satlaj or Basahir forests, which are situated on that river and on its tributary, the Baspa, consist of *Deodar*, or *Deodar* mixed with *Firs*. A full and interesting report on these forests was published by Drs. Brandis and Stewart in 1865. The forests are situated on slopes of from 25° to 45°, generally at great distances above the river. In former years timber had been largely felled by Mr. Arathoon, Soda Sing, and other contractors, and more lately (though under supervision), by Messrs. Brassey, Wythes and Company. The forests still contain probably 1,00,000 fine *Deodar* trees. All these trees cannot, however, be considered workable, as the exceedingly precipitous character of the cliffs would render the expense of getting out the timber much greater than the profit derived from its sale could be expected to recoup. The timber still remaining available will amply suffice, under proper management, for all probable requirements of the Indus Valley Railway, as well as those of the Government works, and of the large cities in the southern districts of the Panjáb.

The Kashmir Forests.

26. Dr. Stewart, who visited the Kashmir forests and reported on them in 1868, estimated the 1st class *Deodar* trees at 1,17,000, as under:—

In the Ravi tributaries ...	...	5,000
„ Chinab and Bhutna ...	...	35,000
„ the Wardwan river ...	...	37,000
„ the Kishanganga ...	...	40,000
	TOTAL ...	1,17,000

The Kashmir forests everywhere exhibit the most wasteful system of working. No attempt whatever is made to form slides, or to save the timber from being broken to pieces when precipitated into the river. The trees are felled in easy places wherever it is possible, without any reference to the protection of the remaining stocks or to shelter for reproduction; forest fires are allowed to rage uncontrolled, and with heavy demands on the market, these forests will in all probability soon be utterly ruined, so far as reproduction is concerned. It would seem good policy by utilising the resources

of the Government forests, and by refusing, as far as is compatible with economy, the temptation of the lower prices at which timber can be offered for sale by the traders on the Chinab and Jhilam rivers, to do something for the protection of the forests of Kashmir. Our own plains in the Panjáb are watered by the rivers which flow from the Kashmir hills, and if the latter are denuded of timber, disastrous results will assuredly follow from time to time in the country below them, in the shape of alternate droughts and floods, results which have actually occurred in France on several occasions during the present century, owing to the denudation of trees on the Alps. The timber traders care nothing, provided one out of every ten trees reaches the water side in safety, what happens to the remaining nine, or how many of them are broken to pieces in their fall. They can always supply timber for great works cheaper than the Forest Department, who are compelled to fell on a system which necessarily entails much labor in removing the logs. If then we desire to preserve the forests from which the traders bring their timber, we must refuse to deal with these people at all, and we must rely, as far as possible, on the timber resources which are under the control of the British Government.

The State Railways

27. There are two lines of Railway now under construction by the State in the Panjáb which are dependent on its forests for a supply of timber, *viz.*, the Northern State Railway (an extension of the Dehli and Lahor line running from Lahor to Peshawar), and the Indus Valley Railway, an extension of the Lahor and Múltan line, which will join Lahor and Múltan with Karáchi.

Their supply of timber.

28. The Northern State Railway has been supplied with timber from three rivers,—the Chinab, Ravi, and Jhilam,—the Government supply having been aided by considerable purchases to the extent of 8,70,000 cubic feet, which were made in order to save the Government forests from being over-felled. Fuel for works of construction has been supplied from the rakhs of Lahor, Gújranwala, Gujrat, and Jhilam to the extent of 4⅔ lakhs of maunds. Of late private lands have been indented on for fuel, as being nearer the line, and the fuel consequently cheaper.

29. For the Indus Valley Railway no regular delivery has yet been commenced; but the principal portion of the timber must, it is believed, come from the Satlaj and Bias rivers. A commencement, however, has been made to saw up sleepers at Lahor and on the Chinab for transport to Múltan, and rather above a lakh of cubic feet of *Deodar* have been purchased from the Native merchants on the Swat and Cabúl rivers for transport *viâ* the Indus to the works on this line.

30. The fuel supply is entirely met from the rakhs in the Múltan District, the main demand being at the Satlaj Bridge works. The fact that the price of the fuel in the Government rakhs has been lately raised for conservancy purposes, has brought a good deal of private wood to the works,—a most desirable result, tending to preserve the Government rakhs against heavy demands which will eventually come on them for engine fuel.

Guaranteed Railways.

31. The open lines in the Panjáb (Guaranteed Railways), are the Dehli and Lahor, and Lahor and Múltan lines. These lines are partly laid with iron pot sleepers, and partly with timber purchased on the Chinab and Bias, and from Messrs. Brassey, Wythes and Henfrey's works on the Satlaj forests. The fuel demand was met by a contractor at Lahor, who purchased from Government large areas of forest rakhs for clearance. As this resulted in the total denudation of all fuel lands

near the Railway line, the price was raised, which has had the desired effect of driving the contractor to seek his supplies from private rakhs and village lands, which will probably suffice until the large artificial plantation of Changa Manga is sufficiently grown up. This plantation, together with the finely wooded rakhs of the Montgomery and Múltan Districts, will eventually provide the main supply of fuel to both these lines of Railway. The price of fuel varies at present from Rs. 30 to 45 per 100 maunds delivered on the Railway line.

Works of Messrs. Brassey, Wythes, and Henfrey in the Satlaj Forests.

32. Allusion has been made to the works of Messrs. Brassey, Wythes and Henfrey in the last paragraph. Six years ago, this firm purchased from Mr. Arathoon 8,000 standing (*deodar*) trees in the State forests, which had been granted him by Government. The firm sent Mr. Paul as an agent, together with a staff of assistants, into the forest to bring out the timber. Mr. Paul's works in these forests only merit notice as having been the first works established in the Himalayan forests to bring out timber on principles which evinced some care as to the condition in which it came to depôt, and some desire to avoid the loss and waste which had characterised all former operations. The slides and other works employed by these gentlemen are of a rough and simple character, well enough adapted to, and sufficient for the purpose for which they were intended, *viz.*, that of getting the logs out of the forests into the river. They are, in short, very much of the same character as those commonly used in the forests of Europe for the same purpose. Except a good road (which, however, would seem to have been unnecessarily long and expensive), most of these works have now fallen into disrepair, and have become obliterated from the effects of the weather and climate. It may be gathered from Mr. Paul's published accounts that he and his assistants brought out about ten lakhs of cubic feet of timber in five years, at an average cost of about 5½ annas per cubic foot, a result not widely differing from the works of the Government Forest Department in the Panjáb Forests.

OUDH.

Principal districts and towns, and the sources from whence they obtain their wood.

33. Kheri, Bharaich, and Gonda are the only districts in which there is any extent of natural forests. In these the villagers living in the neighbourhood of the forests obtain the wood they want for farm and household purposes, as well as fuel and grass for thatching, either free or at a small cost. In the other districts of Oudh, wood is comparatively scanty and expensive. In Hardui, Sitápur and Faizabad, there are a few woodland grants, chiefly consisting of *dhak* coppice, from which the neighbouring population draw some amount of fuel. Most of the houses in Oudh have mud walls, and flat, mud-plastered roofs supported by rafters of *Mango* and *Babúl*. Plantations of the latter have been made by private individuals in many of the districts naturally destitute of trees, and are said to be paying their owners well.

34. The principal towns, including Faizabad, Rai Bareli, and others, are to some extent supplied by wood brought down the rivers Gúmti and Gogra from the forests of Upper Oudh and Nipal; but in most parts of Oudh cowdung is burnt for fuel, and, owing to the limited extent of grazing grounds, the cattle are generally stall-fed, suitable crops being raised to supply fodder.

Position and composition of the principal forests.

35. The principal forests, which lie along the Nipal boundary are in reality only strips cut off from the great Nipal jungles. They, like other forests along the foot of the Himalayas, consist

mainly of *Sâl*, *Terminalias*, and *Conocarpus*, and are interspersed with open glades of grass lands, partially cultivated by Tarûs and other jungle tribes.

Oudh and Rohilkand Railway.

36. The Oudh and Rohilkand Railway runs through the province, crossing the Sarda at a point near Bhamghat on the west, to Faizabad on the east, with a branch from Lacknow to Cawnpur, and having a total length of nearly 300 miles. It is still under construction; but it is believed that it will be laid chiefly on iron sleepers, so that the demand for wood for the permanent way will not be large. It is, however, probable that a large amount of fuel from the Oudh forests will be supplied for the Locomotive Department of this line.

The Nipal Sâl forests; their position and extent

37. The larger part of the Nipal *Sâl* forests are situated on the head waters and tributaries of the Gogra, the Ganduk, and the Kosi. Nothing reliable is known of their actual extent, or of the varieties of timbers they may contain, and British Officers, who, with orders from the Nipal Government have visited them, were never, it is believed, allowed to see the forests from which the finest logs are obtained.

Timber trade with Nipal

38. The Nipal Government formerly was accustomed to dispose of its timber in log to traders, who themselves brought it out of the forests, but this is no longer done; the timber is now carted and sent to depôt by the local Forest Department under the Nipal Government, and is disposed of by auction. The last sale took place in 1868, when 50,000 logs were sold, which realised an average price of 12 annas per cubic foot. There are now 75,000 more logs collected at the Nipal Depôts near Philibit and in other localities, and another sale will, it is expected, shortly take place. The timber is generally straight, round, free from knots, of good length, and generally superior to the *Sâl* of the Oudh forests.

CENTRAL PROVINCES.

Position and composition of the principal forests.

39. In these provinces enormous tracts of country are covered with jungle, of which a comparatively small portion only can be properly designated as forests; some of these latter, now much worked out, were in former days famous sources of timber supply. The forests of the Mandla District, at the head of the Narbada river, contained, previous to 1860, when the first operations for the Great Indian Peninsula Railway commenced, immense quantities of *Teak*. At that time no Forest Department was in existence, and the forests fell into the hands of speculators, by whom the trees were ruthlessly felled; and in most instances were burnt where they lay by the jungle fires, for want of funds on the part of the speculators to bring the logs to depôt. In the ranges of hills south of the Narbada, which separate this district from Raipur, are vast *Sâl* forests; their distance from the centres of supply saved them from the destruction which has nearly ruined the *Teak* forests; since then the increased prices offered by the Railway Companies have enabled the Forest Department to bring down a small portion of this *Sâl* timber, but the distance of the forests will always greatly reduce their practical value. Further down the Narbada, in the neighbourhood of Pachmari, is a considerable *Sâl* forest, named Dela Kari, which is believed to be the most westerly position in which *Sâl* is found in Central India. West again, in the districts of Baitúl and Hoshangabad, are the forests of Bori, Jamgarh, Sauligarh, Rajo-Borari, and Kali-bhit, from the *Teak* timber of which the great cities of Malwa, Indor, and Ujjain were built. The Mahomedan merchants of these cities

exported the wood in large quantities to Rajputana. A small amount of *Teak* is still left, but half a century must elapse before a regular yield can again be expected from these forests. The hills between the Narbada and the plains of Nágpur are covered with extensive forests, but in them there is but little timber of any value, excepta few scattered patches of *Teak* trees, which are generally indifferent in quality. South of Nágpur, along the Godaveri river, there is a large amount of magnificent *Teak* timber, but these forests also lie under the disadvantage of being at a great distance from the centres of demand, and are besides, for the most part, on the properties of semi-dependent zamindars. To the east of Nágpur, in Chhattisgarh, stretches the great *Sál* belt, which extends across the centre of India, from the head of the Narbada to Cattack. Here again distance interferes with the general utility of the timber, which has never been used except for local purposes.

Principal districts and towns, and the sources from whence they draw their wood supplies.

40. With the exceptions of Nágpur (with Kampti), Jabbalpur, and Ságar, there are no towns of any very considerable magnitude in the Central Provinces. For the supply of Nágpur with ordinary building timber and bamboos, a large tract of forest, about 1,250 square miles in extent, has been demarcated and reserved north of the city, in the Sioni hills, and an officer has been specially appointed for its management. Jabalpur is supplied from the jungles on the Narbada, eastward towards Mandla. Ságar draws its supplies from the small *Teak* reserve of Garakota, in its own neighbourhood, and from the forests near Ratgarh and Shahgarh. In all other parts of the province local supplies are found amply sufficient for the wants of the population.

State Railways.

41. Two lines of State Railways within the limits of the Central Provinces have received Government sanction; one of these starts from the Warda Station on the Great Indian Peninsula Railway, and runs to the Chanda Coal-fields,—a distance of about 75 miles; the other is about 80 miles in length, going from the Kandwa Station on the same line to Indor, the capital of Malwa. The first of these will be supplied by the Forest Department with *Teak* timber for sleepers from the leased forests of Ahiri; for the other line 20,000 sleepers have been ordered through the Forest Department, half of which will be cut from the old stunted *Teak* trees left in the Baitúl forests, and half from several kinds of what are considered the inferior timbers of these jungles, the utility of which for railway purposes will now be tested.

The Ahiri and Panabaras Teak forests.

42. These forests have been alluded to in a former paragraph. They belong to the Ahiri and Panabaras zamindars, and from them, in past years, an enormous amount of magnificent *Teak* timber was exported north to Nágpur, and south to Haidarabad and the Deccan; a small quantity was also sent down the Godaveri to Coconada, on the eastern coast of India. Owing to the pecuniary necessities of the zamindars, these forests fell into the hands of the Native bankers of Nágpur and Haidarabad. But for some years past Government has held the forests on lease, and negotiations are now pending for the purchase of those of Ahiri. Should the purchase be effected, it is hoped that, after the debts of the zamindars have been liquidated, a considerable balance will still remain in hand for the improvement of the estate, and a valuable piece of property will thus fall into the hands of Government, by whom it will be carefully looked after and saved from the destruction which otherwise would inevitably fall upon it. The local Government proposed the same measure with regard to the Panabaras

forest; but it has been already worked to such a ruinous extent that it is more than doubtful whether it is now worth purchasing.

The Eastern Zamindari Forests, and their condition.

43. The whole of the large tracts of land lying between the rivers Mahanaddi and Godaveri, and to the north of the Mahanaddi, along its tributaries, the Hasdu, the Bahmini, and the Sunk, are covered by one vast expanse of forest, which has been well described in the reports of the late Lieutenant James Forsyth, and in those of Major Glassfurd, Deputy Commissioner of Sironcha. In parts of these tracts, but more especially in the Rajah of Bastar's territory, there is much fine *teak*, and, along the Mahanaddi, both teak and *Sâl*. The great distance from all centres at which these forests lie, and the consequent difficulty of obtaining any revenue from them, added to their vast extent, which would necessitate a costly conservancy establishment, renders their proper supervision impossible. It has not therefore been attempted, but a certain amount of control is exercised through the zamindars by the influence of the civil officers. As a rule, however, it may be said that the jungle tribes cut, burn, and destroy these forests for temporary cultivation and other purposes unchecked by any control, and according to their own will and pleasure. In the *Sâl* forests, too, thousands of trees are killed annually to extract their resin, which, under the name of *Ral*, is exported in large quantities to Calcutta. Great exertions, but it is feared as yet with little success, have been made to teach the people that it is not necessary to destroy the tree in order to extract its resin.

The great Sâl belt of the Mahanaddi and its affluents.

44. The following admirable description of the great *Sâl* belt of Central India is taken from the late Lieutenant Forsyth's Report on the Forests of the Chhattisgarh Division [Selections from the Records of the Government of India, Public Works Department, No. XLVII of 1864, page 176]:—

"The great belt of *Sâl*, which beginning in the Rewah State, "runs across to Mandla and covers the Mikal range of hills, "stretches in an almost unbroken expanse over the whole of the "country lying to the north of the ghât line that bounds the fertile "plain of Rattanpur on the north, comprising the zamindarees "of Paindra, Kainda, Laafa, and Matin, west of the Hasdú river, "and Kúrba and Uproda, east of it. Thence it appears to "continue eastward, covering the hilly country north of the Maha-"naddi valley in the Raighar State and the British territory of "Sambalpur, and, sweeping round to the south by Bamra and "Ridacol, it re-appears south of the Mahanaddi and covers the "greater part of the Gurjat States of Patna, Kharriar, and "Bindra Nowaghar. Following northwards again the line of the "Jonk river, it forms the principal feature of the forests of Phúljir, "Saranghar, and the Raipur district in the neighbourhood of "that river.

"Over the greater part of the country thus covered by the "*sâl*, however, it is of a scrubby and inferior description, and it is "only here and there, and chiefly along the course of the tribu-"taries of the Mahanaddi, that it assumes the dimensions of "timber. In some parts of the country this is to be attributed "to the annual cutting down of tracts of forests for the pur-"pose of cultivation, which has been practised by the Gonds, "Bhúmeas, Binjwars, Khonds, and other wild tribes from time "immemorial. In many other places, where this cause has not "been in operation, the nature of the soil or the climate appears "to be hostile to the growth of the tree. It seems to luxuriate "in sheltered valleys where the soil is formed of the detritus from

"the neighbouring hills; and a poorish, light soil, if of sufficient "depth, appears to suit it better than an extremely rich one. "Exposure to the direct action of strong winds, or of severe "frosts, seems to be fatal to its growth, as, although it exists "in such situations, we have not observed it anywhere of large "size. The practice of cutting out a piece of bark near the root "for the purpose of extracting the dammer resin of the tree—a "valuable article of commerce—has no doubt helped to destroy "the large trees in many places.

"Following the course of the *sâl* belt eastwards from Amar "Kuntuk, we find it first assumes the dimensions of a forest of large "trees, on crossing the Bahmini river on the road to the so-called "'Tiriapahar,' which is a mere plateau covered with *sâl*. Al-"though nearly 2,000 feet above the sea, the Tiriapahar is "actually lower in level than the country between it and Amar "Kuntuk, and has no title to the 'hill' as used in English. "The trees here are tall and straight, and are plentiful, of from 4 "to 6 feet girth. We arrived here too late to do anything towards "ascertaining the distance to which this forest extends. Native "report says that it covers a space of about 5 coss square between "the Bahmini and Hasdu rivers, which would give about 150 "square miles. Further to the south, good *sâl* is said to exist "in the Kainda Zamindari, along the course of the Arpa "River, and a good patch, very accessible from Bilaspúr, is "found in the Laafa Zamindari east of Tartúma. East of "the Hasdu river, the only *sâl* forest of any importance is in "the Kúrba Zamindari. This forest we estimated to cover an "area of about 90 square miles, and to contain 1½ lakhs of trees "over 4 feet in girth (many of which are 8 or 9 feet), and about "twice as many under 4 feet (see Report on Bilaspúr Forests). "Still further eastwards, and beyond the limits of our exploration, "*sâl* exists of large size, as we were informed by the Kardar of "Raighar in that State, along the course of the Mád river, a "tributary of the Mahanaddi. Most of the *sâl* used for building "the large flat-bottomed boats that ply on the latter river is cut in "Raighar and floated down the Mád in the monsoon. North of "Sambalpur, the upper valley of the Ebe river, and the hilly "country bordering on the Sunk river, are reported by persons who "have visited them to be wooded with fine *sâl*: north-east of Sam-"balpur, in Bamra, much fine *sâl* exists about Gaurpali, along the "Matigor and Bahmini rivers, down to which it could be floated in "the rains. Eastwards of Sambalpúr we have been informed "by officers who have traversed them, that Ridacol and Rampur "are covered, in a great measure, with *sâl* of the finest sort. These "our time and instructions would not permit us to visit. South of "the Mahanaddi, the Patna State is well supplied with this timber, "the same forest extending over the hilly parts of Borasamar and "Kharriar. The valleys of the Jonk river and its tributaries "furnish several fine forests of *sâl* timber; in fact nearly the "whole of the Jonk valley is covered by this tree. It commences "near the village of Chindoli, 10½ miles south of Sukra, and runs "northwards without a break to Maharaji, near the mouth of the "Jonk river.

"The *sâl* has, however, been much injured by Dhya clearings "over the greater portion of this length, although many fine trees "are still to be found; and it is along the courses of its tributary "streams that the best forests are now to be found. The Kantura "Nala, which rises in the western hills of Sonikan and flows east-"wards into the Jonk near Sukra; the Karmail Nala, rising in the

"Phúljir hills to the east and joining the Jonk about 8 miles south "of Sonikan; the Tar Nala, which circles Hathibari hill and falls "in opposite Sonikan,—all contain in their valleys very fine *sál* "forests, in which trees of 4 to 6 feet are plentiful, and many "specimens of double these sizes are to be found (see Sonikan "Report). The Sarahi Nala, rising near Gada Dongri hill, in "Saranghar, and flowing north into the Mahanaddi, has also along "its course much magnificent *sál*.

"These latter forests, namely those in the neighbourhood "of the Jonk river, appear to be of much greater importance "than any others in the division. From them would be drawn the "greater part of the supply of timber for the construction of any "works to open up the Mahanaddi valley."

The Rewah Forests.

45. These forests extend through the Sohagpur District, formerly belonging to Mandla, along the upper part of the Soane river, east of the Khaimor Range, and around the Bandúgarh Fort. It is known that they once contained a good deal of *Sál*, but little is supposed to be now available, as much of what could easily be worked has already been taken away, several of the mercantile firms in Mirzapur having executed contracts to supply sleepers to the East Indian Railway from these forests. Many sleepers in past years were supplied to this Railway, and it is believed that the Oudh and Rohilkand line has recently obtained a large number from the same source.

BRITISH BURMA.

General position of the forests.

46. As being the great source from which *teak* timber is supplied to the markets, not only of India, but of Europe, the forests of British Burma possess a high value. The principal forests of the Rangoon Division are found on the Pegu, Pounglin, and Shyn rivers. Those in the Tharawaddi and Eastern Prome Divisions extend along the western spurs of the Pegu Yomah. The Sittang forests, both to the east and west of Tonghoo and the Sittang river, extend along the eastern slopes of the Pegu Yomah on one side and along the high ground and spurs at the base of the Panloung range on the other. On the Salween, the principal *teak* forests are the Thoungyin, Attaran, and Houndrau to the south, and the Beeling, Doomdamee, Toonzaleen, and Upper Salween Forests to the north of Maulmein.

Principal districts and towns, and sources whence they draw their supply of wood.

47. The forests of the Rangoon District, as above enumerated, meet all local wants, and furnish large supplies of ordinary timbers (besides *teak*) and bamboos to the Rangoon market; but poles for roofing and fencing are cut in the delta of the Irrawaddi and brought up to Rangoon by boat. Superior kinds of wood for boat-building are imported from Tonghoo. The timber and bamboos on the Tharawaddi side of the Myanoung District are only used locally, but on the Irrawaddi large quantities of bamboos and common timber are exported to places down the river and to Rangoon. North of Rangoon, in Prome, much Catechu is manufactured from the *A. Catechu*, and forms a considerable article of trade. Down the Mindoonchoung and its feeders, bamboos and wood are brought to Thayetmyo for local use, as well as very large quantities of Catechu for the Rangoon market. The out-turn of Catechu from this and the Prome District amounted in 1869-70, to 1,38,142 maunds, or about 5,000 tons, valued at 13½ lakhs of rupees.

In Bassin, the slopes and spurs of the Arrakan Yomah furnish timber and bamboos for local use, as well as for boat-building. The Tonghoo and Maulmein Districts contain abundance of timber for local use, as well as for export.

48. The Kado Depôt is situated on the Salween river, six miles above Maulmein. Here all the timber imported by private parties from the Shan States, and from other timber forests in independent territory, is caught and kept in depôt under charge of the officers of the Burma Forest Department until it is sold. The timber is stored on the banks of the river and on the adjacent islands, which at high tides are submerged. A duty of Rs. 2-12 per log of 5 feet girth and upwards is here paid to the British Government, and half rates for timber below that standard. The above rate is equal to about Rs. 2-15-5, or 6 shillings per ton. The timber is protected by two Government guard-houses which stand at the points of ingress and egress, and two guard-boats, anchored in the main stream to command the entrance into Maulmein and secure the drift timber.

The timber trade of Burma.

49. The following table shows the amount of timber passed into the Kado Timber Depôt from foreign territory during the last five years, and the amount of duty paid on it:—

Year.		Timber		Amount of Duty.
		Tons.		Rs.
1866-67	...	55,867	...	1,25,555
1867-68	...	73,703	...	1,85,755
1868-69	...	62,509	...	2,14,004
1869-70	...	44,184	...	1,38,549
1870-71	...	65,482	...	1,49,967

The average cost of the timber, inclusive of duty, to the importer is about Rs. 32 per log, which realises from Rs. 45 to Rs. 60 per log, or even higher for choice pieces. Picked pieces for the English market of not less than from 25 to 35 feet in length realise from Rs. 45 to Rs. 55 per ton. For shorter pieces, from Rs. 35 to Rs. 45 per ton is given. At Calcutta, *teak* ranges from Rs. 60 to Rs. 110 per ton according to quality, and at Bombay from Rs. 75 to Rs. 120 per ton.

MYSOR.

Position and composition of the forests

50. Generally it may be said that Mysor is divided into three great forest belts of unequal width, *viz.*, the evergreen, the mixed, and the dry. The first comprises the country within and immediately below the Western Ghâts. The second extends the whole length of the province from south to north, and is of very unequal width, varying from 10 to 40 or 45 miles. The third belt comprises the remainder, and by far the larger portion of the province.

51. In the first division are found the *Wild Jack* (*Artocarpus*), the *Pún (Spar) Tree*, (*Calophyllum*) *Ebony*, *Ironwood*, and (towards the east) *Blackwood*. In the second belt, *Teak*, *Blackwood*, and *Bijasal* are the predominating trees. In the lower forests are *Conocarpus*, *Zizyphus*, *Hardwickia*, and other trees common to the forests of Southern India.

Principal districts and towns, and sources whence they draw their timber supply.

52. There are three main civil divisions in Mysor, *viz.*, Nagar, Ashtagram, and Nandidrúg. Nagar possesses the largest tracts of forest land, and draws on no other districts for its supplies of timber and general forest produce. Much timber has been exported from the Sorab and Shikarpur Talúks of this division to the

Bombay Province of Dharwar; this exportation was carried to such an excess that a large portion of the district forests, formerly under the civil officers, has been placed under the direct superintendence of the Forest Department. The division of Ashtagram contains two districts, Hassan and Mysor. Hassan contains within its boundaries many fine forests, but much of its land is held by coffee planters, and the inhabitants draw a large portion of their timber supplies from Khurg; portions of the district are very badly supplied with wood, while in others large grazing lands belong to owners, who themselves live in the Madras Presidency. In these the jungle is much stunted, and great difficulty in consequence is often experienced by the agricultural population in obtaining the amount of wood necessary for house-building, &c. The district of Mysor grows enough wood in small scattered patches for the ordinary purposes of its own consumption, and helps, besides, some of the neighbouring Talúks, both to the south-east and north-west, which are chiefly under wet cultivation. Nandidrúg possesses no great forests, and no *teak*, with the exception of a few solitary trees, scattered through the jungle. For all large timber this division indents on Mysor. Of small wood for ordinary native huts and for agricultural purposes, the district affords a sufficient supply; but even this, it is said, is being fast exhausted, and its due care and conservancy is perhaps more important, as a forest question, than any other in Mysor. It is on this account most desirable that the district forests of Mysor should, as has already been recommended to the Government of India, be placed under the Forest Department, if adequate arrangements can be made for supplying the wants of the people by departmental agency.

The Sandal Tree; its cultivation, sale of its wood, revenue, &c

53. The *Sandal-wood* Tree grows in almost all parts of Mysor; it is not found in dense forests, either evergreen or deciduous, and is scarce in the eastern parts of the province; its cultivation is yet in the experimental stage, but plantations are being formed and various methods of rearing it tried.

54. The sale of this wood is a Government monopoly; it is managed by the Forest Department, through whose agency it is uprooted, sawn up, and conveyed in the rough state to the central sandal stores. There it is prepared by the removal of all the sapwood; it is then cut up into billets, classified, and packed in lots of ten Candies (two and a half tons) each, to be sold by public auction. Retail sales are also fixed, but for these the lots have to be broken up, and higher rates are charged in consequence. The annual revenue its sale yields is about Rs. 1,60,000.

Mysor State Railway.

55. The Mysor State Railway is to run from Bangalor to Mysor. Its sleepers (of *Teak* and *Blackwood*) will be furnished from the local forests of the Ashtagram and Nandidrúg Divisions. *Teak* for carriage-building will come chiefly from Nagar; the wood is to be delivered in log by the Forest Department at Bangalor and Mysor, and will be converted, as required, by the Railway Engineers.

New system proposed for the management of the local forests

56. With a view to obviating the waste of timber going on in Mysor, the Chief Commissioner has lately proposed to the Government of India that, as all the forests in the country are public property, they should be placed under the immediate charge of the forest officers, a number of depôts being established throughout the country, where wood will be sold to all-comers. Extensive plantations will also be formed, and the felling of wood for charcoal,

and the method of burning it, will be regulated by officers of the department. Had this strong measure not been adopted, there can be little doubt that the great and unchecked waste now going on would have been severely felt by all classes of the population.

KHURG.

Position and composition of the forests Principal districts and towns, and sources whence they draw their timber supplies.

57. The whole country of Khurg may be more or less regarded as a forest, but owing to the situation of the greater part of the wood in inaccessible and difficult places, much of the wealth of the country in timber is useless at present.

58. There are but few villages in Khurg, and those few are almost entirely located in the northern talúks of Yelusavirasimi and Nanjrajpattan. The Khurgs reside generally in farm houses built many years ago most substantially of *blackwood*, *jack*, *nandy*, and *sampaghi*.. The wood for building was with great labor transported over hill and dale, being dragged and carried by gangs of men.

59. In the north of Khurg the country is more open, and the jungle between the northern point of the Province near Codlipett, and the Cauveri river near Fraserpett, was beginning to be much cut away, not only by Khurgs, but people from the adjoining districts of Mysor. They are now, however, placed on the list of State Forests, and depôts have been selected from whence wood will be sold. The jungles to the east and south of the Cauveri, and the Anikada Forests on its northern bank, supply the comparatively level talúks of Nanjrajpattan and Northern Merkara with wood.

60. The *Teak* Forests in the south-east corner of Khurg are level, and lie below the hills, belonging geographically to Mysor. Nearly the whole of the timber is exported, but little going back to Khurg, chiefly for the use of the Public Works Department of the Province.

61. The valuable forests lie almost entirely along the eastern boundary of the province. The *Cardamom* Forests lie chiefly in South Khurg, in many of which are to be found the *púnn* tree, while the forests which are worked for *púnn* and *wild jack*, on license, lie in the south-west. The heavy ghât forests to the north-west of Merkara are so inaccessible as to be almost useless.

62. No good *teak* is found north of the Cauveri; all forests in this part of the province may be called second class forests; they chiefly yield *blackwood*, *nandy*, *honay*, *mutti* (which is very abundant), *dindiga* (*Conocarpus latifolia*), and a variety of less valuable timbers. The jungles between the Cauveri and Lachmantrit contain a fair amount of *teak*, intermixed with the trees mentioned above. Those south of the Lachmantrit are still more valuable, as containing large quantities of fine *teak*, and all the other varieties of valuable timber to be found in the deciduous forests of Khurg.

THE BERARS.

North Berar Forests, their general position

63. The valley of the Púrna river, comprising the Assigned Districts of Berar, and separated from the Central Provinces by the river Warda, is supplied with timber from the ranges of hills north and south of the valley The tract contained between the two ranges is one of the most fertile in India, a large portion of the cotton sent to Europe from Bombay being grown there. North of the

valley, and separating it from the valley of the Tapti, runs the Chikalda range of hills (an offshoot of the Satpúras), rising to an elevation of from 3,000 to 4,000 feet. In the basin between this range of hills and the Tapti river, there is a dense tract of forest containing a good deal of small-sized *teak*. The old stumps show that in past years fine *teak* timber grew here, but it was all floated years ago down the Tapti to Burhánpur, formerly a large Mahomedan city on the borders of Khandesh and Nimar. This tract still supplies a large amount of small *teak* and *tinnus* (*Dalbergia Oojeiensis*), besides bamboo, to all the northern parts of the Berar Valley.

Forests south of Berar.

64. South of the Púrna Valley, and taking its rise in the Búldana hills, runs the Pem Ganga river, a tributary of the Godaveri. The low hills along this river, which stretch in scattered blocks into the districts of Yot Mahal, Bassim, and Búldana, still contain a good deal of *teak* and *unjun* (a wood with a very hard, black heart). The south of Berr is supplied from these sources; but from repeated coppicing the *teak* has become so poor that, unless it is strictly protected, there is much reason to fear that it will not long continue to furnish even roofing timber for the small native houses of the agricultural population.

Other sources of supply.

65. The steam cotton gins and presses have created a heavy demand for fuel in the centre of the Berar Valley, which has so raised the price of wood that the people have been rapidly felling their old ancestral village groves in order to sell them for fuel. As the civil authorities seemed unwilling or unable to interfere, on the ground that the trees were the absolute property of the people, it has been determined to reserve, wherever it was possible to do so, Rakhs or small reserves of *Babúl* (*Acacia Arabica*), which is found in many parts of the district, and which thrives generally well there. These Rakhs or Buns if well fenced in, so as to exclude cattle and goats, will probably in a few years furnish a good supply of fuel for the wants of the valley, and the village groves will be saved from further destruction.

Forests of the Haidarabad State, not under British management.

66. There are considerable forests of *teak* on the Haidarabad side of the Godaveri, below its junction with the Wyn Ganga, opposite Sironcha and Bastar. It is supposed that a good deal of this timber was taken to the city of Haidarabad in past years; some still remains, to protect which Sir Salar Jung, the enlightened Minister and Regent, has lately organised a small Forest Department. There are also some forests on the Nirmal range of hills between Nágpur and Haidarabad, as also on the borders of Karnúl (the Madras Presidency); but these are far away from all great lines of export, and are supposed not to contain much valuable timber.

PART II.

STATE RESERVED FORESTS.

Register of record of reserved forests.

67. It has been said above that the forest reserves differ greatly in the several provinces of India, both as regards the area they occupy and their actual nature, but that the essential principle on which a forest is called *reserved* is the same everywhere; a reserved forest being one in which the State possesses exclusive rights. For these State forests registers are in course of preparation in each province; in these registers will be recorded the boundaries, areas, contents, and general character of each forest reserve in the province. Each register, when complete, will be accompanied by a map and working plan of the forest; one copy of it is to be deposited in the Office of the Conservator of the Province, and another in the Forest Office of the Division in which the reserve is situated. The preparation of these registers and working plans has been much delayed, partly because proper maps and surveys are still wanting, and partly because many of the best Forest Officers are employed for the present on large timber operations for State Railways and other urgent forest works, such as demarcation and settlement of rights. It is hoped, however, that, before long, tolerably complete registers will be ready in most of the provinces.

68. In almost every part of India it has been found that Government possessed absolute rights in all uncultivated and forest lands, though practically this right had not, as a general rule, been enforced, except spasmodically at intermittent periods. In former days, the Native Government, to keep the people in mind that such a right existed, asserted it from time to time; but wood might be cut, and cattle grazed everywhere, provided there was no interference with the actual wants of Government, which sometimes wished to conserve timber for its own use, or for that of the rulers who wished to preserve game for sport. When the preservation of the forests was taken up by the British Government, the necessity for some more absolute definition of the rights of Government and of those of the people became evident; to establish such a definition, it was necessary to demarcate the forests, so as to determine where the people should still exercise the privileges they had always enjoyed, and where they should cease to do so.

Progress made in the various provinces towards demarcating State forest reserves.

69. Considerable progress, notwithstanding the causes of delay named above, has been made in most provinces towards the demarcation of forests and the settlement of forest rights.

Bengal.

In Bengal, from the great extent of the forests, as well as from the recent formation of the Department there, but little has been done beyond exploring. There are, moreover, political difficulties in dealing with the forest question in many parts of the country, especially in Assam, Cachar, and along the Eastern Frontier, as also in the Sonthal country. Some large tracts, however, defined by natural boundaries, have been taken up by the Department and called forest reserves. Meanwhile the close attention of Government is directed to the question, and the work will now be proceeded with vigorously.

North-West Provinces.

In the North-West Provinces,—thanks to the care and administrative ability displayed by Colonel Ramsay, the Commissioner of Kamaon,—the demarcation of the great *sâl* forests of Kamaon and Garhwal was completed some years ago in a very perfect manner. In these districts forest conservancy was made to go hand in hand with the clearing and settlement of the Bhabar, a tract of barren waste

situated below the foot of the Himalayas. Owing to a substratum of boulders of enormous thickness, the Bhabar possesses neither wells nor water-courses, but by an admirable system of masonry canals, taken off from the rivers as soon as they emerge from the hills, water was provided for cultivation in this hitherto barren tract of country, and the population was easily induced, by the advantages offered them, to leave the forests and take up their habitation in the sub-montane country. A broad road, in length about 160 miles, extending from the Ganges to the Sarda, was then constructed as the boundary of the forest, above which all cultivation was interdicted, and from which cattle were (except in a few defined localities), excluded. The result has been most favorable; and the forests are now everywhere rapidly recruiting themselves, while the Bhabar shows many thousand acres of rich cultivation where formerly there was nothing but an unhealthy jungle. The *Deodar* forests of the lower Tonse are now being demarcated by the Forest Department, aided by a Settlement Officer who has been appointed for Jaunsar. Here, as in the Panjáb, the population are being compensated by a grant of absolute proprietary right in the cultivated land, and in certain portions of the forests, for the absolute reservation of other parts of the forest by Government. In the Dehra Dún the difficulty of demarcation is much enhanced by the numerous properties or grants possessed by private individuals, and intermixed in every direction with the Government forests. An attempt is being made to obtain a lease of these private forests, that the whole may be possessed and worked by Government as one compact and united block. In the meantime broad lines are being cut through the forest, and solid pillars are being put up to mark the boundaries. In the Jhansi Division, as also in Gorakhpur, the Government forests have been thoroughly marked off by the Settlement Department.

Panjáb. In the Panjáb, through the exertions of Mr. Baden Powell, the Officiating Conservator, nearly the whole of the Rakhs, or waste lands covered with jungle, amounting to about 8,000 square miles, in the plains of the Panjáb, have, within the last three years, been made over to the Forest Department. Great progress has been made also in the adjustment of rights, by the adoption of the "give and take" system, by which, in return for making total concessions to the population of definite rights in certain portions of forests where they formerly possessed only uncertain privileges, Government reserve to itself absolute rights in the rest. In all cases these rights of Government will not be at once enforced to their full extent, but gradually, as the people become accustomed to the repressive action of the forest rules, and begin to realise the real advantages of what has been conceded to them. The necessity for moderation in enforcing these rights has also been impressed on all Forest Officers both by the Government of India and the local Government in some parts of the country (as in Hazara and parts of Hushiarpur); the rights of the people to a profit from the forests have been admitted, and even where the management of the forests has been undertaken by the Department, all or a part of the price of the trees is paid to the people on whose ground they stood. The work of demarcation is now in active progress, and in a future report definite figures as to the area of the State forests will be given.

Oudh. In Oudh the State forests, which are not extensive, are all marked off and thoroughly defined.

Central Provinces

In the Central Provinces, too, all the more important forests have been thoroughly demarcated and placed under the control of the Forest Department. Generally, broad demarcation lines have been cut through the jungles, and pillars have been erected to define the boundaries of the forests.

Burma.

In Burma, where the true principles which should regulate the formation of reserves, as being the nurseries of our future timber forests, seem thoroughly appreciated, much real progress has been made. During the last year as many officers as could be spared from other work were concentrated by the Conservator on the work of demarcation, and about 131 square miles of valuable forest have been, after a most complete and careful examination, surveyed and marked off as reserves.

Berar.

The same has been done in North Berar in the Tapti Forests, and is now being carried out in the South Berar forests in Búldana, Bassim, and along the Pem Ganga.

Mysor.

In Mysor, the total area of reserved forests amounts to 398 square miles, out of which 247 have been already demarcated; 45 square miles being ever-green forests marking their own boundaries, will need no other demarcation. A proposal is now before Government for the transfer to the Forest Department of the district forests, now under the management of the Civil Officers.

Khurg

The total area of forests which it is proposed to reserve in Khurg is 374 square miles, but very little has been done yet in demarcating them. No measures will be necessary to commute forest rights, because the land is all Government property, and simply requires to be enclosed.

Plantations.

70. The question of plantations has occupied the Forest Department more or less in several provinces, but in the Panjáb, Burma, and Mysor only has it been taken up with vigour, and on regular systematic principles. It should be borne in mind that in most parts of the country the success of tree-planting is very precarious, attended by much risk of failure, except where water for irrigation from rivers or canals is available. Water has, under the ordinary conditions of soil and climate in India, been found essential to the establishment of young trees, and it is certain that, as a rule, well irrigation will be found too costly to answer for plantations, except in a few localities, where, from its extreme scarcity, wood is likely to realise very high prices. Owing to this risk in the success of plantations, the policy of Government in fostering and preserving the existing forests, with a view to their natural, reproduction, appears a correct one; it is often urged against it, that it would pay better to plant new forests in convenient localities, than to preserve the old ones, which are generally far removed from all great centres of demand and supply. Experience, however, daily proves that, except in a few favored localities, no system of planting can vie, in an economic point of view, with what nature can do, when protected and left to herself.

71. In Burma, the local Government has decided to form a series of *Teak* plantations in large compact blocks on the river above Rangoon, with a separate system on the Salween near Tounghee. These will, according to present proposals, extend over an area of 30,000 acres. A commencement has been made, and up to the end of 1870-71, 1,648 acres had been planted at a cost of Rs. 95,982. It is probable that the cost will be much reduced by confining operations in future, more than has hitherto been done

to certain localities, which will render supervision easier and less expensive, and there can be little doubt that if carefully carried out, under these conditions, the plantations can scarcely fail eventually to repay Government for the outlay incurred on them. It is calculated that if the whole 30,000 acres, as proposed, is planted, the yield, after the plantations arrive at maturity, will be at the rate of 40 cubic feet per acre, or 1,200,000 cubic feet, equivalent to 24,000 tons per annum.

Central Provinces.

72. In the Central Provinces and Berars, a small commencement has been made. In the former province 162 acres have been planted, but the cost, in spite of every care, has been excessive, varying from Rs. 400 per acre in Garakotta to Rs. 225 in Mandla, and Rs. 137 in Baitúl in the valley ot the Machna, which last has been the only moderately successful plantation. It is doubtful if, under the unfavorable conditions of soil and climate, artificial plantations can repay their own outlay in Central India. In Berar, in the Tapti valley, the results are a little more favorable; but care must be taken that the plantations generally do not degenerate into expensive toys of the Department.

Mysor and Khurg.

73. In Mysor and Khurg considerable vigour has been displayed in planting both *Sandal* and *Teak*. The former will probably pay well. Up to the date of the last report, *Sandal* plantations to the extent of 368 acres, *Teak* and general plantations of 123 acres, and fuel plantations of 180 acres, were either in progress or in course of formation in Mysor. In Khurg the areas of plantations are 300 acres of *Teak*, and 600 acres of *Sandal-wood*. The work in these provinces is too recent for the Department to be able to speak with certainty as to the amount of success which is likely to attend the operations.

The Panjab.

74. In the Panjáb the general want of wood throughout the province, as well as the special requirements of the Railways that were being constructed, caused the attention of Government to be directed at an early period to the necessity of establishing plantations on a large scale in the province. At first the difficulty of acquiring land, and the absence of all knowledge based on actual experience, led to the formation of a number of detached blocks. But the impossibility of properly supervising such scattered plantations, and the consequent frequency of failure, as well as increase of expense, have lately led the Forest Department to consolidate their works on larger and more compact blocks. The most successful plantation up to date is that of Changa-Manga, about 44 miles from Lahor on the Múltan Railway. This plantation is situated on the Bari Doab Canal, from which it is supplied with water for irrigating the young trees. About 4,200 acres have been planted up to date with *Sissú*, *Bér*, *Kikar*, and other trees, and the whole area may be said to be doing well. The oldest trees are now more than four years old, and appear beyond any risk of failure. I carefully inspected the whole plot this year, and was most fully satisfied with the practical and efficient manner in which the work was being carried on by Mr. Ribbentrop, the Deputy Conservator now in charge of the Plantation Division. The most satisfactory feature in this plantation is the evenness of the results over a large area, which seems far preferable to any amount of premature development in a few scattered places. It is proposed to complete the present block to 7,000 acres in the next two years; and there can be but little doubt that from 1881-82 it will yield the anticipated annual net revenue of Rs. 33,000, which will amply repay Government for the outlay which will have been

made on it, and which up to date is somewhat under a lakh of Rupees. It is proposed to extend the present Changa-Manga plantation (if the water-supply for it proves sufficient) to 15,000 acres. Possibly an area of 20,000 acres may eventually be reached. From it the whole Railway above, as far as Amritsar and the Bias, will be supplied, besides which it will afford large supplies of fuel for Lahor. In the northern Panjáb a fuel plantation is being established in Jhilam, in the south there are others near Ludhiana and Dehli. There is also a Sailâba (alluvial) plantation extending over about 1,200 acres along the Ravi near Shahdira, which has been created to supply the wants of Lahor. A large corner of this plantation was carried away by erosion last year. It is believed that no fear need be entertained for the safety of the rest, but this liability to erosion by any change in the course of a river is a serious drawback to plantations on alluvial deposits.

Fuel Rakhs or Buns.

75. Besides the plantations which have been formed, as detailed in the last paragraph, large tracts of forest land suited for the produce of fuel and small timber have been taken up, and are being reserved in various provinces. Of these the Rakhs in the Panjáb are the principal. In extent they cover an area of about 8,000 square miles. From these Rakhs the main supplies of wood-fuel in the Panjáb, both for public works, railways, and private purposes, are now drawn.

76. The Unreserved forests in the Central Provinces are of the same description. Some of these are now being more closely conserved, and in the more important ones junior Forest Officers have lately been appointed to work in connection with District Officers. North of the city of Nágpur a large tract of forest has been demarcated and divided into blocks, and a regular system of working by rotation laid down for it. Its area is about 1,200 square miles, divided into four main blocks, and is known as the "Great Satpúra Reserve."

77. In Berar, where wood-fuel is lamentably scarce, several large *buns* or jungles of Babúl (*Acacia Arabica*) are now being conserved. Their combined area amounts to 11,240 acres, besides a large tract of low scrub jungle near Amraoti, which covers nearly 200 square miles, on the low hills near that city. It is hoped that if cattle and goats are kept out, they may form useful reserves of small timber, and save the village groves, which here, as in so many other parts of India, are being cut down and sold by the rural population.

Leased forests.

78. To supplement the supply of timber from the forests of the State in the Panjáb, North-West, and Central Provinces, several of the principal forests lying in territories under Native rule have been taken on lease by Government. In this way the *Deodar* forests of the Basahir State on the Satlaj and Pabar rivers, the *Deodar* forests in Chamba on the Ravi and Chinab, the forests in Poari, the Tehri Rajah's forests on the Tonse and Bhagirati, the forests in Native Garhwal, and the *teak* forests of Ahiri and Panabaras on the Godaveri and its tributaries, have come under the management of the Forest Department.

Conservancy arrangements, and working of the protective establishment.

79. The main principles impressed by the Government of India on the Forest Department have been—

1*st*.—The definition and demarcation of the State forests

2*nd*.—The suppression of jungle fires.

3rd.—The exclusion of cattle from the forests, and where this is not possible, restriction of grazing rights.

4th.—The opening of roads, building of forest huts, and other works calculated to facilitate travelling through the forests.

5th.—Cutting of creepers and clearing the grass round young trees.

To carry out these works, establishments of natives have been sanctioned in all provinces. It is to be desired that these establishments should by degrees be arranged on a more uniform system than at present, and the pay and designation of the different grades more assimilated. In many provinces the subordinate establishments cannot be considered in any other light than as a merely temporary arrangement for carrying on the work. The subject will be recurred to hereafter in the Report.

Roads and other works for improving and opening out the forests.

80. In several provinces much progress has been made by the Department towards rendering the forests accessible, and otherwise improving them, while rest-houses or huts for the accommodation of the officers on their tours have been constructed. The Secretary of State for India has, happily, spoken strongly on this last point, and it is not possible to over-estimate the advantage which the Department derives from the small percentage of expenditure that is devoted to this purpose. Many of the forests are exceedingly unhealthy, while others are situated in distant parts of the Himalayas in very rigorous climates. It will be seen at once then how necessary it is for the health of the officers that such shelter should be provided for them. Young and physically strong men are often too apt to be careless of their own health till it is too late; but as nothing so disorganises the Department, or renders systematic work so impossible, as the breaking down in health of three or four officers in one working season, and the necessary departmental changes which ensue, so nothing will conduce to efficiency and contentment among the establishments more than the feeling that Government is not unmindful of the comfort, convenience, and health of its officers.

81. In the Panjáb, shelter has now been provided for the officers in most of the important forests, and some useful roads have been constructed by the Department in the Satlaj and Chinab. In the North-West Provinces a road to open out the Gangútri Forests has lately been completed at a cost of three lakhs of rupees. This road is about 91 miles in length, extending from a point on the Ganges where it meets the Masúri and Naini Tal road, to within 8 miles of the village of Nilang at the foot of the Pass of that name from the Ganges Valley into Thibet. This is one of the easiest of all the Himalayan Passes, rarely being covered with snow during the summer months, and the road to it, the construction of which was originally necessitated by Forest requirements, will in course of time no doubt become an important trade line.

82. In the Kamaon and Garhwal Forests a very perfect system of roads was planned and completed in past years by Colonel Ramsay, while the forests were under his charge. To the easy export provided by these roads the large revenue which these forests yield is attributable. They have been usefully supplemented by a cart road constructed across the hills from the Kosi river to the Ram Ganga, and by a road now under construction from Baremdio up the Sarda, which will open out the forests of that river.

83. In Oudh the forest line cut through the Kheri Forests from Súnaripur to Khairigarh will give access to the main part of these forests, as also will several minor roads or lines recently constructed in the Bharaich District.

84. The principal roads which have been constructed by the Forest Department in the Central Provinces are, one of about 45 miles in length from Mandla to the *Sál* Forests on the Rajahdhar and Chilpi Ghâts; another across the hills from the valley of the Moran to Sioni in Hoshangabad (one of the main lines of timber export, in length about 18 miles); and a third which goes through the forests on the Towa and Deinwa at the foot of the Pachmari Hills.

Systems of irregular and temporary cultivation in the Indian forests, with remarks on the causes that lead to it, and the tribes that practise it.

85. Of all agencies inimical to forest conservancy which exist in the Indian forests, the most destructive, and at the same time the most difficult to deal with, is that of irregular or temporary cultivation, as practised by the wild tribes in all parts of the country. In the Himalayas and North-West generally it bears the name of "Kil"; in Bengal it is called "Júm," in Madras and Mysor "Kúmri," in Central India "Dhya," in Burma "Toungya," but everywhere it is essentially the same in character and method of practice. The system is as follows: a portion of the hill side is cleared in April or May of all trees and shrubs. These are chopped up into moderate sized pieces and carefully spread out to dry. In June, when the first indications of the coming rains are seen, the dry wood is set fire to, and in the ashes a crop of millet is sown, which is reaped in September or October, and provides the cultivator with subsistence for himself and his family for the ensuing year. After two, or at most three crops have been taken from the ground, the field is deserted, and a fresh clearing made, the original field being again fit for purposes of cultivation, after a lapse of from ten to fifteen years, when the wood has grown up sufficiently to admit of being re-felled. This irregular kind of cultivation seems to have special attractions for the tribes who practise it, as the labour required is small, while the profits are great, neither plough nor cattle being necessary to prepare the field for seed. Moreover, the rents paid by the wild tribes who follow this their favorite irregular system of cultivation, are in all parts of the country infinitely lower than those paid for lands cultivated under a more civilized and elaborate system; under peculiarly favoring circumstances, it is asserted that as much as four hundred-fold of the seed sown has been realised in the crop when reaped, and an increase of one hundred and fifty-fold is believed not to be uncommon. Even where other descriptions of cultivation are freely available and are practised by the people who possess forest land suitable for clearings, it is difficult to restrain them from burning the jungle and raising crops of millet. They usually retain the millet for home consumption, which enables them to send their more valuable grains to market. The destruction of timber is of course enormous, and even the advantage of rendering the country less malarious by clearing away the forest is not attained, as a dense and tangled thicket of brushwood invariably springs up when the field is deserted. In almost all provinces great steps have been taken to put down this destructive system. In all Reserved forests it is absolutely interdicted, and in the open forests, wherever total restriction is not possible, efforts are continually made by the Civil Officers to control it, and confine it within definite limits. It cannot be said that the hill tribes look on such restrictions without dislike, but they are daily becoming more and more accustomed to them, and it is hoped in time, as the more remote

parts of the country become opened out by roads, and access is afforded to the markets of the plains for the sale of wheat and the more valuable sorts of grain, that the wild people of the jungle will see the advantages of regular cultivation, and that the destruction of the forests will gradually be lessened.

86. Considering the immense injury that such unlimited denudation causes, the necessity of conservancy is generally admitted on all hands, and the difficulty of adjusting the question of rights between the Government and the people must be faced. At the same time it may be a question whether in some parts of the country the vast tracts of jungle which exist are worth preserving, even if it were possible to do it, and in very large forests their own size is generally their best protection.

Forest rights

87. Now this question of rights in the forest is one not easy of adjustment, especially where it assumes a political bearing, from the fact that the greater portion of the people belong to those classes who inhabit the forests, and, as it were, live on them. Many of these tribes never acknowledged any right in the land superior to their own, till they submitted to our Government, and nothing would probably do more to throw back the progress of civilization among them than any hasty or injudicious interference with their forest privileges. There can be no doubt (I quote the sense of an able letter of Mr. Madocks, Commissioner of the Bhagalpur Division, to the Bengal Government [Bengal Proceedings, No. 19, for July 1871], who expresses very clearly the position) that although Government has an admitted proprietary right to these tracts, still the claim of the hillmen to the occupancy of the uninhabited hills is too substantial, and one which has been too distinctly recognised by Government to be set aside without due consideration; for while admitting the proprietary right of Government, as the paramount power, to the soil and its appurtenances, the forest tribes regard the right as one to be paternally exercised, and they no doubt consider that as long as they live peaceably in their forests, forgetting their traditional pursuits of plunder and raid, Government should allow them to rest in peace, and to pursue their customs and avocations unmolested. For these reasons Government has exercised a wise policy in demarcating Reserved forests, from which our future main stores of timber should be drawn, and in which such systems of cultivation are absolutely put down, while outside their boundaries, generally, a more temporising policy has been adopted, the forests being for the most part entrusted to the care of the Civil Officers. It will be both possible and advisable, by gradually and judiciously asserting the claims of Government, and avoiding any sudden enquiry into the question of prescriptive rights, to accustom the minds of the people to our presence in the forests, and to dispel their pre-conceived ideas of quiet and undisturbed right to the brushwood and jungle. To this end, when Reserved forests are taken up, it should be the invariable practice of the Forest Department to make large concessions of forest tracts, within which the people may act as they please. If confined at once to the narrow limits sufficient for a civilized and cultivating labourer, there can be no doubt that in many parts of the country grave discontent would be engendered in the minds of those classes of the population who practise the irregular cultivation described above.

Cattle grazing and forest fires.

88. Closely connected with the above subject is that of cattle grazing and jungle fires. The latter (to which the destruction of millions of seedlings every year may be attributed, as well

as the stunted growth of the greater portion of the Indian forests, and probably also the hollowness or heart-shake of much of the best timber in them) are in nine cases out of ten to be attributed either to the persons who graze cattle in the forests, and who burn the grass to obtain a stronger crop in the succeeding year, or else to the spreading of fires kindled for the irregular cultivation described in the last paragraph. Cattle are now excluded from the Forest Reserves in most provinces, and much progress has been made in regulating their grazing everywhere, so that even where the grass is fired, the fire should not spread into the best forests. The restrictive measures, however, outside the Reserves are for the most part best left to the Civil Officers, who will take into consideration the degree in which they can be made to press on the people without causing them unnecessary hardship. As regards fires, it has been urged that the finest natural forests in India have been burnt every year without apparent injury (as for instance those in the Nipal Terai), but this is attributable to their great natural advantages of soil and position, which have enabled them to thrive in spite of treatment, which in less favored localities would be inevitably fatal to the ready reproduction of the forests.

PART III.

YIELD OF THE FOREST.

89. The following statement shows the yield or out-turn of timber from the Forests in the several Provinces during the last five years:—

Provinces	1866-67	1867-68.	1868-69.	1869-70.	1870-71.
	Logs and pieces, excluding bamboos.	Logs and pieces, excluding bamboos.	Logs and pieces, excluding bamboos.	Logs and pieces, excluding bamboos.	Logs and pieces, excluding bamboos
Bengal	5,595	37,721	41,589	4,026	4,962
N W Provinces ...	1,06,502	1,21,896	92,892	1,46,654	77,849
Panjáb	42,210	29,375	29,375	29,543	66,871
Oudh	626	967	756	725	6,023
Central Provinces ..	37,504	15,116	26,298	42,362	14,673
Burma	31,549	52,448	69,735	55,395	72,510
Mysor	3,339 2,395 Candies of Sandal-wood	4,707 2,366 Candies of Sandal-wood	5,864 2,455 Candies of Sandal-wood.	4,442 2,529 Candies of Sandal-wood	9,544 880 tons of Sandal-wood.
Khurg	.....	1,436 511 Candies of Sandal-wood	809 406 Candies of Sandal-wood.	1,363 392 Candies of Sandal-wood.	665 60 tons of Sandal-wood.
Berar	... .	. .	464	16,940	13,863
TOTAL .	2,27,325 2,395 Candies of Sandal-wood.	2,63,666 2,879 Candies of Sandal-wood	2,67,782 2,861 Candies of Sandal-wood	3,01,450 2,921 Candies of Sandal-wood	2,66,960 940 Candies of Sandal-wood.

90. The Government of India having undertaken the construction of certain lines of Railways which are designated "State Railways," it has been decided that such timber as may be required for sleepers and other works shall be supplied by the Forest Department. Special arrangements have therefore been made on a large scale for the supply from the forests of the North-West Provinces of timber required for the Rajputana State Railway, and from the Panjáb for the Northern State Railway. In the year under review these operations were first set on foot, and the supplies of timber and sleepers made by the Forest Department will be seen from the subjoined table:— *Timber supplied to State Railways.*

Railways.	Provinces.	Logs or sleepers	Cubic feet.	Value.
				Rs.
Northern State Railway .	Panjab ..	17,916 logs of Government timber	2,72,014	1,36,020
		23,950 „ purchased for S. Ry.	4,97,114	4,91,754
Rajputana State Railway	N. W Provinces	43,883 sleepers 10′ × 8″ × 4″ @ 2-8	87,420	1,09,707
		39,943 „ 10′ × 10″ × 5″ @ 5-4	1,38,602	2,39,659
		TOTAL ...	10,05,150	9,77,140

91. The following is a statement of the principal timber depôts in different Provinces:— *Principal Timber Depôts.*

NORTH-WEST.

Ram Ghat ... On the Jumna.
Hardwar ... „ „ Ganges.
Sanahi ... At the foot of the Garhwal Hills.
Ramnagar ... On the Kosi, at the foot of the Kamaon Hills.

PANJÁB.

Shádira Shápur	}	On the Ravi.
Phillor	...	„ „ Satlaj.
Wazir bolar Nadaon	}	„ „ Bias.
Wazirabad	...	„ „ Chinab.
Jhilam	...	„ „ Jhilam.

OUDH.

Biram Ghat	...	On the Sarda river.
Sitiana	...	„ „ Sohili „
Shitaba Ghat	...	At the junction of the Sohili and Koriali Rivers.

THE CENTRAL PROVINCES.

Goari Ghat	...	Near Jabalpur.
Bori	...	(Pachmari Forests.)
Sioni	...	Hoshangabad.

BURMA.

Kado	...	6 miles above Maulmain.

MYSOR.

Mysor	...	In Mysor.

In Berar there are six wood bazaars below the Chikalda hills, where timber is stored.

System of depôting timber.

92. In the early times of the Forest Department any one wanting wood usually applied to the Forest Officer of the Division, and the two went out together on an elephant or on foot, to hunt up logs wherever they could be found stranded on river banks. Now that regular depôts have been established, the timber is stored for sale in a very systematic manner. In the Himalayan rivers, it is usual to assign a serial number to each log brought out of the forests and launched in the river. This number is cut deeply into the log, and, together with the cubic contents of the log, is entered in the forest register; other marks showing the forest from which the log is taken, as well as the year of felling, being cut into the log, so that not only its cubic contents, but age and original locality can at once be recognised. At suitable places below the hills catching depôts are located, and the river is watched during the floods by men stationed for the purpose, who go out on inflated skins and bring the logs to shore. Certain fixed rates are paid for all logs thus stranded in a place of safety. They are afterwards, at convenience, brought into the depôts, the marks on them are compared with the forest register (copy of which is furnished to the depôt), and they are brought on the depôt stock accounts. It can thus be ascertained at any time what timber is in the river, as well as what is lying in the various depôts.

93. The timber is afterwards disposed of either by auction, or offered for sale at fixed rates. The State Railways have a prior claim to all timber by special order of Government, but all other parties, public or private, who come as customers to the depôts, are treated alike. The same procedure, modified as required by local circumstances, is followed in depôts where land carriage is used to bring the timber out of the forests.

PART IV.

UNRESERVED AND PRIVATE FORESTS.

Unreserved forests, and forests under management of the Civil authorities

94. Besides the Reserved forests of the State, there are, in various parts of the country, large tracts of jungle to which, from their immense extent, it is not possible to apply the principles of forest management in their strictest sense. These forests are termed Unreserved, and have been confided to the charge of the District Civil Officers.

Bengal

95. In Bengal, on the Eastern Frontier, Government have been obliged, for political reasons, to place the primary control of the forests under the Civil Officers, and orders have been issued that no operations should be commenced without the consent of the Commissioners of Divisions. In other districts of Bengal the same arrangements as in the Central Provinces exist for the management of the Unreserved forests. In the Panjáb, Oudh, Mysor, and Burma, all forests of any value are either actually under the control of the Forest Department, or are being transferred to it. In the North-West Provinces, the outlying strips (in Bijnaur and Bareli) of the Terai, or lower Sub-Himalayan forests, belong to the category of Unreserved Forests, as also do the forests of the Jhansi Division. In the Central Provinces and Berar, large portions of almost every district have necessarily been left to the Civil Officers for the collection of their forest revenue, for which the ordinary revenue machinery answers well; were it collected by the Forest Department, a large additional staff of officers would be necessary. The main control of the exports of these forests lies with the Forest Department, who also act as advisers to the district officers in such matters. Junior officers have, as an experimental measure, in four of the principal districts, been placed under the Civil Officers of the district to act under their orders as assistants in the forests.

North-West

Central Provinces and Berar.

Revenue collected from Unreserved Forests

96. The following is a statement of the revenue collected by Civil District Officers from Unreserved Forests :—

Province.	1866-67.	1867-68	1868-69	1869-70	1870-71.
	Rs	Rs	Rs.	Rs	Rs
Bengal ...	41,690	56,039	53,362	73,552	58,534
North-West Provinces ...	52,441	30,661	40,123	41,900	30,686
Panjàb ...	...	...	...	...	...
Oudh ...	...	...	...	...	
Central Provinces ...	1,82,845	2,72,303	2,49,162	3,14,899	3,71,852
Burma ...	...	...	...	...	12,492
Mysor ...	...	...	...	...	...
Berar ...	...	1,725	4,403	6,037	11,899
TOTAL ..	2,76,976	4,60,728	3,42,647	4,36,388	4,85,463

Methods by which the revenue of unreserved forests is collected in different parts of the country

97. In the earlier years of forest management, two methods for collecting the revenues of Unreserved Forests obtained : one was the contract system, under which the forest was leased out in large blocks to natives who could offer security for their meeting the demands of Government; to these men the right of collecting the revenue was sold for a fixed sum, paid either annually or quarterly : the other was known as the Kham Tehsil system, under which the revenue was collected by posts placed at the outlets of the forest for taxing

the exports. As a rule, neither of these systems were found to answer. However strictly the contracts might be drawn up, it was found that the contractors, under various pretexts, made themselves simply timber merchants, and took from the forests large stores of timber, which they kept in reserve to sell for their own benefit, when their leases should expire ; besides this, they soon acquired too great a power in forest matters, which they invariably used to oppress the neighbouring population. The Kham Tehsil system, on the other hand, broke down where large areas of forest had to be guarded, from the insufficient numbers of any establishment for watching the forest outlets that could be sanctioned, and from the ease with which subordinates were corrupted. In the Central Provinces these difficulties have been met by the substitution, in place of the old system, of two fresh schemes which seem likely to be adopted also in other provinces. One of these is well known as Forsyth's system, having been originated by the late Captain Forsyth, Deputy Commissioner of Nimar, and formerly an Assistant Conservator in the Forest Department; the other is called the commutation system, which we owe to Major Lucie Smith, the energetic Deputy Commissioner of Chanda. By Forsyth's system, passes or licences are sold for cash at the tehsil and other sub-revenue establishments. The holders of these passes must then go to the subordinate officers in charge of the different forests, by whom they are told where they may supply themselves with the articles of forest produce they want, named in the passes ; the forest officer being also responsible that not more than the quantity demanded and paid for is taken away. By the commutation system, villagers assenting to the arrangement are assessed at a certain rate per house, in return for which they are given the right to supply themselves from particular jungles with grass, fuel, and small timber for building and agricultural purposes. That both these systems have worked well, in a financial point of view, a reference to the preceding table will show. It remains to be seen whether they leave to the Forest Department sufficient power of control and forest conservancy.

Private forests, sacred groves, and temple forests.

98. In many parts of India, but notably in the Himalayas and Khurg, patches of forest surrounding temples have from time immemorial been held sacred. Within the precincts of these forests are found some of the oldest and finest trees to be met with anywhere. Till quite lately, these temple forests had been universally spared, but the increase of late years in the value of timber has led to some of the trees being cut down. In Khurg especially, it has not unfrequently happened that the priests owning the temples have themselves cleared the adjacent sacred forests, and on their site made coffee plantations, the proceeds of the coffee being devoted to the shrine. In Gorakhpur, where repeated coppicing has almost destroyed the *sâl* trees, there is an interesting example of a fine *sâl* forest of considerable extent, surrounding a Mahomedan shrine, which is kept up for the purpose of supplying fuel for the sacred fire kept continually burning there.

Special measures taken for the protection of the temple forests.

99. This subject attracted the attention of His Excellency the late Viceroy ; at his special desire lines of demarcation have now been drawn round each temple forest, within the limits of which no trees may be cut down, and no forest officer, except for purposes of conservancy, can exercise any authority. Conservators in their annual reports are ordered to mention whether the trees within these boundaries have been strictly respected.

Destruction of timber trees in the agricultural districts.

100. The introduction of railways, as well as of steam gins for cleaning cotton and other agricultural purposes, has in some parts of the country, where fuel is scarce, caused the destruction, to a

lamentable extent, of the village groves and the few trees scattered over the fields. In Berar this mischief has been especially marked, and was seriously protested against by the forest officers, but it was decided by the revenue authorities that the trees being the property of the people, interference was impossible. That a similar destruction of timber has taken place in Oudh and the North-West Provinces, there can be no doubt, and the attention of Government was lately called to the subject by the Agri-Horticultural Society of Bengal. In a recent correspondence between the Agent of the Oudh and Rohilkand Railway and the Forest Department, about the supply of fuel for the Railway, it was urged, as a reason for the Department lowering the price of their fuel, that *mango* wood, which can only be obtained from the village groves, was to be had at barely half the price of fuel from the forests.

Necessity of taking measures for the protection of village groves and scattered timber

101. The enormous amount of evil which must result from such a wholesale destruction of what little timber there is in thinly wooded plains, requires no comment. For sanitary and climatic reasons alike, every tree now standing should be strictly preserved. It is a well-known fact that a few trees near a village, besides affording grateful shade during the long hot season, materially affect the temperature, and there can be little doubt that their foliage tends to purify the air ; yet in the face of these now established truths, the people are cutting down their ancestral trees in all directions, while Government in many places is making grants of lands, either rent-free or at reduced assessments, to encourage the formation of plantations. Attention, however, has at last been attracted to the subject, and local Governments have been called on for reports as to the best methods of checking this growing evil.

Introduction of Australian, Californian, and English fruit trees

102. The naturalisation of foreign trees in India has lately been much thought of. About 20 years ago various species of the Australian *Eucalyptus* and *Acacia* were introduced with marked success on the Nilgiri Hills in Madras, where many thousand acres of these timber trees may now be seen. Subsequently, attempts were made to rear these trees in the plains of the Panjáb, and though there are some remarkably fine specimens of Gum trees in the gardens at Lahor, the experiment cannot be considered to have been generally successful. At Ránikhet (the new Military Cantonment in the Kamaon Hills), where the soil and climate would seem to be remarkably favorable, a large number of Australian trees have within the last few years been raised, and promise to be thoroughly successful. Besides the trees already named, many species of *Casuarina* and *Bog-oak* have been imported, and seem to thrive well at Ránikhet. Acorns of the *English oak*, the successful transport of which is attended with so much difficulty, have been safely brought to this country and reared at Ránikhet, as also specimens of the *Douglas Pine*, *Wellingtonia*, and other Californian trees. Under the auspices of the present Lieutenant-Governor, a large nursery of English fruit trees has been also started there, with a view to future distribution through the Kamaon and Garhwal Hills. The whole of the Ránikhet plantations have been placed under the management of Mr. Craw, who, having been specially trained in the higher branches of arboriculture, is peculiarly fitted to the charge. Hitherto the Forest Department has had ample occupation in re-inhabitating the ruined forests of the country, and generally bringing its working system into good order. The introduction of foreign trees cannot be looked on as strictly coming within the range of its duties, but the Department has now become more consolidated, and as some of the officers can bring the advantage of special knowledge to the work, it has been thought right by Government to entrust it to their charge.

PART V.

FINANCIAL.

Financial.

103. The following tables (Forms 21 to 28), will show the financial proceedings of the Forest Department under the several local Governments and Administrations. They have been prepared, as closely as possible, in the forms prescribed for the Department, and have been condensed from the statements which accompanied the several local reports. Immediately following these tables will be found a set of statements showing the amounts realised and expended by the Forest Department during the last five years.

FORM 21.

Annual Summary of Revenue and Expenditure during 1870-71.

Classification.	Bengal.	North-West Provinces.	Panjab.	Oudh.	Central Provinces.	Burma.	Mysor.	Kburg.	Berar.	TOTAL.
REVENUE—	Rs.	Rs.	Rs	Rs.	Rs.	Rs.	Rs	Rs.	Rs.	Rs.
I.—Sale of timber at depôts	53,298	49,869	6,92,845	2,704	2,49,138	3,51,624	3,06,755	38,106	5,061	17,49,400
II.—Sale of timber removed by purchasers	3,768	1,27,843	1,78,873	20,369	25,580	2,61,467	19,808	6,423	5,274	6,49,405
III —Duty on foreign timber	.....	.....	70	.....	.....	1,49,957	.....	.....	4,201	1,54,228
IV.—Permit fees	961	15,661	99	1,959	2,77,925	16,832	.....	28,407	1,12,374	4,54,308
V.—Grazing dues	1,042	32,173	1,23,702	22,426	41,385	.....	133	.....	30,547	2,56,408
VI.—Sale of fruits, &c.	60	1,25,558	293	6,959	38,972	.....	1,669	880	17,357	1,91,748
VII.—Sale of confiscated timber	.....	1,449	48	1,443	2,526	9,973	5,570	.....	612	21,621
VIII.—Fines and forfeitures	224	1,745	3,742	370	1,326	1,425	3,734	161	62	9,055
IX.—Miscellaneous	1,790	9,490 / 1,288	19,748	3,951	21,268	26,846		.....	1,791	88,618
Total Receipts	61,143	3,65,076	10,24,420	60,181	6,58,120	8,18,124	3,37,669	74,067	1,77,279	35,76,079
EXPENDITURE—										
A. Conservancy and Working.										
I.—Timber expenses	9,990	3,23,553	8,99,978	35,643	1,13,875	2,00,587	63,467	8,295	403	16,55,791
II.—Purchases of stock and cattle	6,599	8,158	8,189	893	4,956	20,165	1,716	129	1,849	53,404
III.—Feed and keep of cattle	2,570	7,772	906	2,731	10,770	11,444	.....	.....	2,853	39,046
IV —Rent of leased forests	.....	24,580	22,871	.....	.....	.....	219	.....	17,120	64,790
V.—Charges in collecting revenue	55	20,732	81	320	19,594	.....	252	.....	13,257	54,291
VI.—Plantations	1,691	2,043	71,270	492	20,054	30,282	10,098	5,957	5,246	1,47,133
VII —Forest work	139	10,116	32	3,650	11,862	4,777	508	12	914	32,010
VIII.—Forest survey	1,516	4,274	6,450	271	3,078	15,696	620	.....	.....	31,905
IX —Experiments on timber	47	368	8	7	50	.....	.....	.....	2	482
X.—Communications and buildings	1,567	1,40,361	21,466	8,865	11,012	5,718	4,181	429	1,526	1,95,125
Total Conservancy and Working	24,174	5,41,957	10,31,201	52,872	1,95,251	2,89,469	81,061	14,822	43,170	22,73,977
B. Establishments.										
I.—Salaries	47,466	1,05,186	1,31,291	37,689	86,221	97,4	51,951	7,252	26,071	5,90,556
II.—Travelling allowances	9,244	18,460	36,090	6,332	11,272	8,463	7,895	2,020	7,786	107,062
III.—Contingencies	3,476	10,282	10,745 / 26,481	3,098	14,639	4,674	5,035	505	5,030	57,534 / 26,481
Total Establishments	60,186	1,33,928	2,04,607	47,119	1,12,182	1,10,566	64,381	9,777	38,887	7,81,633
GRAND TOTAL OF EXPENDITURE ...	84,360	6,75,885	12,35,808	99,991	3,07,433	4,00,035	1,45,442	24,599	82,057	30,55,610

Note.—The amount due for sleepers delivered at Delhi by the North-West Provinces, estimated at Rs. 3,36,000 could not be included in the accounts of the year as the price had not been fixed by Government.

FORM

Annual Abstract Account of the Cash Transac

DR.

HEADS OF ACCOUNT.	Bengal.	N. W. Provinces.	Panjab.	Oudh.	Central Provinces.	Burma.	Mysor.	Khurg.	Berar.	TOTAL.
To Cash Balance on 1st April 1870 ...	1,350	78,211	1,95,840	19,741	24,360	7,725	8,988	17,158	3,725	3,57,098
,, Revenue received	61,143	8,65,076	10,24,420	60,181	6,58,120	8,18,124	3,37,669	74,067	1,77,279	35,76,079
,, Remittances from State Treasuries...	81,618	6,85,337	10,78,558	1,08,098	2,86,761	3,84,571	1,52,097	21,623	87,516	28,81,179
,, Deposits	1,673	.....	.....	471	16,557	9,398	.....	.....	.....	28,099
,, Advances recovered	16,310	22,104	6,30,037	59,175	1,31,288	10,624	.....	.....	10,002	8,79,540
,, Subscriptions to Funds, Income Tax, &c.	1,221	1,368	2,756	960	2,561	3,396	.....	.....	841	13,103
,, Remittances from Public Works Department	.....	877	.....	.....	11,550	.....	.....	.....	.....	12,427
,, Value of Medicines from Military Department	.....	.....	.....	109	.....	.....	.....	.....	.....	109
,, Error in Accounts	1	.....	.....	.....	.....	.....	.....	.....	.....	1
,, Official Postage	276	.....	479	303	5,021	.....	.....	.....	.....	6,079
TOTAL ...	1,63,592	11,52,973	29,32,090	2,44,038	11,36,218	12,33,836	4,98,754	1,12,848	2,79,363	77,53,714
Deduct difference between *Revenue* shown in this Statement and Statement 21	.....	1,288	.....	.....	.....	.....	.....	.....	668	1,956
GRAND TOTAL ...	1,63,592	11,51,685	29,32,090	2,44,038	11,36,218	12,33,836	4,98,754	1,12,848	2,78,695	77,51,758

.22

tions of the Forest Department during 1870-71.

Cr.

Heads of Account.	Bengal.	N. W. Provinces.	Panjab.	Oudh.	Central Provinces.	Burma.	Mysor.	Khurg.	Berar.	Total.
By Expenditure of the Department ...	84,360	6,75,885	12,35,808	99,991	3,07,433	4,00,035	1,45,442	24,599	82,057	30,55,610
„ Remittances to State Treasuries ...	60,315	3,88,146	11,49,133	59,978	6,57,951	7,84,467	3,35,827	74,067	1,77,280	36,87,164
„ Repayments of Deposits ...	1,301	1,139	.....	65	16,826	7,211	.....	.....	.....	26,542
„ Advances made	15,273	22,710	5,18,249	68,493	1,11,114	8,013	.....	.....	16,011	7,60,763
„ Refunds of Revenue	.....	21	15	955	11,550	114	2,133	149	50	14,987
„ Advances recovered and Subscriptions to Funds, Income Tax, &c., paid into Treasuries	.....	.....	.....	.....	.....	.....	.....	.....	839	839
„ Remittances to Public Works and other Departments	.....	33,756	.....	.....	1,497	21,121	.....	.....	.....	56,374
„ Cost of Medicines from Military Department	.....	.....	.....	109	.....	.....	.....	.....	.....	109
„ Error in Accounts	1	.....	.....	1,202	.....	.....	.....	.....	437	1,640
„ Official Postage	276	.....	.....	303	.....	.....	.....	.....	.....	579
„ Cash Balance on 31st March 1871 ...	2,066	32,348	28,883	12,650	29,847	11,977	15,352	14,069	2,021	1,49,213
Total ...	1,63,592	11,54,005	29,32,088	2,43,746	11,36,218	12,33,838	4,98,754	1,12,884	2,76,695	77,53,820
Difference between *Expenditure* shown in this Statement and Statement 21 ... Add ...	.....	.....	2	292	.....	.....	.....	.....	.....	294
										77,54,114
Deduct ...	.....	2,320	.....	.....	.....	.....	.....	36	.....	2,356
Grand Total ...	1,63,592	11,51,685	29,32,090	2,44,038	11,36,218	12,33,838	4,98,754	1,12,848	2,76,695	77,51,758

FORM 23.

Annual Statement of Outstandings and Liabilities of the Forest Department in 1870-71.

Local Governments.	Department Debtor.			Department Creditor.			Balance due.		Remarks.
	At commencement of the year.	Recoveries in cash, and value of supplies and work done during the year.	At close of the year	At commencement of the year.	Payments made during the year.	At close of the year.	To Department (Outstandings).	By Department (Liabilities).	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Bengal	...	9,049	9,049	13,759	11,690	25,449	16,400	...	Excess payments to contractors only.
North-West Provinces	11,235	2,44,105	2,55,340	37,741	4,09,221	4,46,962	1,95,269	3,647	Outstandings on account of sales, and excess payments to contractors, furnished in one statement.
Panjáb	...	8,31,017	8,31,017	3,94,972	6,37,230	10,32,202	2,01,586	401	Ditto furnished in two statements.
Oudh	24,223	85,899	1,10,122	34,849	1,13,930	1,48,779	52,728	14,071	Ditto ditto.
Central Provinces	4,246	5,36,899	5,41,145	3,37,514	2,69,799	6,07,313	77,306	11,138	Ditto furnished in one statement.
Burma	...	1,70,204	1,70,204	2,60,961	1,76,259	4,37,220	2,67,016	...	Excess payments to contractors only.
Mysor	...	81,352	81,352	8,987	87,717	96,704	15,352	...	Ditto ditto.
Khurg	...	18,078	18,078	17,158	12,799	29,957	14,069	2,190	Ditto ditto.
Berar	...	13,641	13,641	24,451	16,011	40,462	26,821	...	Outstandings on account of sales, and excess payments to contractors, furnished in one statement.
Total ...	39,704	19,90,244	20,29,948	11,30,392	17,34,656	28,65,048	8,66,547	31,447	

The Local Returns (Form 23) from which this statement has been compiled do not all exhibit the same information. Some exhibit only the outstandings on account of sales; others the excess payments to contractors, as well as outstandings on account of sales, either separately or conjointly. The following statement will show these items separately, and for convenience of comparison with Statement 28, the value of timber and other stock is also exhibited.

Provinces.	Value of timber and other stock at the commencement of the year.	Value of timber and other stock at the close of the year.	In favor of the year.	Against the year.	Outstandings on account of sales at the commencement of the year.	Outstandings on account of sales at the close of the year.	In favor of the year.	Against the year.	Excess payments to contractors at the commencement of the year.	Excess payments to contractors at the close of the year.	In favor of the year.	Against the year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	2,98,664	2,81,806	...	16,858	318	714	396	...	13,759	16,400	2,641	...
North-West Provinces ...	1,60,888	5,07,490	3,46,602	...	37,741	1,95,268	1,57,527	...	...	...	...	...
Panjáb	3,26,424	5,22,167	2,25,743	...	1,65,175	65,019	...	1,00,156	2,29,797	1,36,166	...	93,631
Oudh	1,46,475	2,35,849	89,374	...	2,400	7,687	5,287	...	32,449	45,041	12,592	...
Central Provinces ...	3,04,854	3,02,351	...	2,503	3,37,514	77,306	...	2,60,208	...	...	...	...
Burma	1,52,562	2,64,897	1,12,335	...	26,760	2,736	...	24,024	2,60,961	2,67,016	6,055	...
Mysor	1,75,262	2,28,371	53,109	...	3,350	12,720	9,370	...	8,988	15,352	6,364	...
Khurg	26,608	25,701	...	907	6,599	10,910	4,311	...	17,158	14,069	...	3,089
Berar	3,680	1,906	...	1,774	24,451	26,821	2,370	...	...	...	...	...
Total ...	15,95,417	24,00,538	8,27,163	22,042	6,04,308	3,99,181	1,79,261	3,84,388	5,63,112	4,94,044	27,652	96,720
Outstandings of Permit-holders, Burma ...	...	...	...	...	...	...	...	...	28,803	45,000	16,197	...

FORM 24.

Statement of Timber brought to Forest Depôts in the several Provinces during 1870-71.

Provinces.	Description of Timber.					Estimated cubic feet.	Total of each Province.	
	Logs.	Beams (kurries.)	Planks and Scantlings.	Sleepers.	Miscellaneous pieces.		Pieces.	Cubic feet.
Bengal	2,734	.....	618	1,567	43	The estimated cubic contents cannot usefully be shown, as they are not in all cases entered in the local returns.	4,962	The estimated cubic contents cannot usefully be shown, as they are not in all cases entered in the local returns.
North-West Provinces ...	935	27,593	34,185	1,409	13,727		77,849	
Panjáb	59,215	2,076	.....	5,580	.....		66,871	
Oudh	6,023	.....	.....	.....	.....		6,023	
Central Provinces	3,303	.....	.....	11,370	.....		14,673	
Burma	23,080	32	.....	2,712	306		26,130	
Mysor	.....	.....	.....	.....	.....		.....	
Khurg	.....	.....	.....	.....	.....		.....	
Berar	60	18	.....	.....	13,785		13,863	
Total ...	95,350	29,719	34,803	22,638	27,861	.....	2,10,371	

FORM 25.

Annual Timber Account—Forest Department—for 1870-71.

	Bengal.	N. W. Provinces.	Panjáb.	Oudh.	Central Provinces.	Burma.	Mysor.	Khurg.	Berar.	Total.
I.—Stock in hand at depôts at the commencement of the year—										
Logs	7,464	6,267	21,307	4,731	21,864	33,553	...	...	7,606	1,02,792
Beams (kurries)	...	21,504*	...	...	...	...	...	...	...	21,504
Planks and Scantlings	10	525	...	...	...	...	...	...	...	535
Sleepers	44,708	...	...	725	20,784	...	...	...	...	66,217
Miscellaneous	89,948	21,059	...	...	1,595	...	...	...	..	1,12,602
Total ...	1,42,130	49,355	21,307	5,456	44,243	33,553	...	...	7,606	3,03,650
II.—Timber received at depôts—										
Logs	2,734	2,076	66,871	6,023	3,303	19,837	...	...	13,863	1,14,707
Beams (kurries)	...	22,261*	...	...	...	...	...	...		22,261
Planks and Scantlings	618	39,567	...	...	...	...	...	...		40,185
Sleepers	1,567	..	...	...	11,370	2 712	...	...	...	15,649
Miscellaneous	4	13,945	...	...	...	3,621	...	...	...	17,569
Total	4,962	77,849	66,871	6,023	14,673	26,130	...	...	13,863	2,10,371
By transfer	...	4,073	...	...	...	...	...	...	...	4,073
Excess due to sawing of Sleepers	...	...	30	...	...	...	...	...	...	30
Brought by Permit-holders	...	...	...	...	..	46,380	...	...	...	46,380
Registered for duty at Kado Revenue Station	...	..	...	...	...	92,007	...	...	...	92,007
Total ...	...	4,073	30	...	..	1,38,387	...	...	...	1,42,490
GRAND TOTAL .	1,47 092	1,31,277	88,208	11,479	58,916	1,98,070	...	.	21,469	6,56 511

	Bengal.	N. W. Provinces.	Panjáb.	Oudh.	Central Provinces.	Burma.	Mysor.	Khurg.	Berar.	Total.
I.—Timber removed by purchasers from depôts during the year—										
Logs	1,143	3,330	40,939	412	5,171	14,207	...	...	10,820	76,022
Beams (kurries)	...	27,525*	...	...	...	..	...	...	...	27,525
Planks and Scantlings .	13	28,636	...	...	...	...	...	...	...	28,649
Sleepers	17,434	...	...	...	15,252	...	...	...	...	32,686
Miscellaneous	784	29,548	.	...	...	...	...	...	...	30,332
Total .	19,374	89,039	40,939	412	20,423	14,207	...	...	10,820	1,95,214
II.—Timber lost and used by the Department—										
Logs	11	2,517	441	105	3,036	2,227	...	...	...	8,337
Beams (kurries)	.	1,041*	...	...	...	...	...	..	...	1,041
Planks and Scantlings . ..	243	2,513	...	...	...	...	...	...	..	2,756
Sleepers	4,338	...	...	250	2,631	...	...	...	...	7,219
Miscellaneous	88,362	373	...	...	...	...	...	...	...	88,735
Total ...	92,954	6,444	441	355	5,667	2,227	...	...	...	1,08,088
III.—Stock in hand at depôts at the close of the year—										
Logs	9,044	4,923	46,828	10,237	18,600	64,088	...	...	10,649	1,64,369
Beams (kurries)	...	16,202*	...	...	...	...	...	...	...	16,202
Planks and Scantlings	613	9,235	...	...	...	...	...	...	...	9,848
Sleepers	24,503	...	..	475	14,226	...	...	...	...	39,204
Miscellaneous	604	5,434	..	...	...	...	...	...	...	6,038
Total ...	34,764	35,794	46,828	10,712	32,826	64,088	...	...	10,649	2,35,661
Cleared on payment of duty at Kado Revenue Station	...	...	...	...	.	71,168	...	...	...	71,168
Logs sold by Permit-holders	...	...	...	...	...	46,380	..	...	...	46,380
GRAND TOTAL ...	1,47,092	1,31,277	88,208	11,479	58,916	1,98,070	...	...	21,469	6,56,511

* Includes Sleepers.

FORM 26.

Statement showing the amounts realised on account of Timber sold during 1870-71.

Provinces.	No. of Logs sold.	Cubical Contents.	Amount realised and due on account of Timber sold.	Average amount per Log.
			Rs.	Rs. As. P.
Bengal	19,374	The estimated cubic contents cannot be shown, as they are not entered in all cases in the local returns, and the logs differ so widely in description, quality, and size, that nothing in the shape of information would be gained from the figures, if attainable.	43,279	2 3 9
North-West Provinces	89,039		70,031	0 12 7
Panjáb	45,522		5,53,181	12 2 5
Oudh	392		7,991	20 6 2
Central Provinces	20,423		93,747	4 9 5
Burma	14,207		3,37,573	23 12 2
Mysor	.....		.....	.....
Khrug	.....		.....	.....
Berar	10,820		3,292	0 4 10
Total ...	1,99,777		11,09,094	
Difference between amount shown in this Statement and Statement 25. — Deduct (Panjab) ...	4,583			
	1,95,194			
Add (Oudh) ..	20			
	1,95,214			
Add value of Timber not yet delivered in Bengal			10,365	
Add amount collected by District Officers, Berar and Central Provinces			2,359	
Add discrepancy in the Panjáb and Central Provinces, Returns			32,181	
			11,53,999	
Deduct amount credited under Head VII, Revenue, Burma			9,973	
			11,44,026	
Deduct amount due but not realised during the year			58,440	
			10,85,586	
Add amount realised on account of former years			3,18,953	
Add amount of Timber Sales in Mysor			3,06,755	
Add amount of Timber Sales in Khurg			38,106	
Total shown as Revenue on account of Timber Sales in Statement No. 21			17,49,400	

FORM 27.

Statement showing the amounts expended on account of Timber received in Depôts during 1870-71.

Provinces.	No. of Logs.	Cubical Contents.	Timber Expenses.	Conservancy expenses, cost of Establishments, &c., of the Department, including Direction.	Total amount expended, including Direction.	Average amount paid per Log.
			Rs	Rs.	Rs.	Rs. A. P.
Bengal	4,962	The cubical contents cannot be usefully shown, as they are not in all cases entered in the local returns, and the logs differ so widely in description, quality, and size, that nothing in the shape of information would be gained from the figures, if attainable.	9,990	7,043	17,032	3 6 11
North-Western Provinces	77,849		3,23,553	1,24,102	4,47,655	5 12 0
Panjáb	56,429		8,10,886	1,16,126	9,27,312	16 9 0
Oudh	6,023		35,643	3,064	38,707	6 6 9
Central Provinces	43,200		1,13,875	96,779	2,10,654	4 14 0
Burma	26,130		1,77,795	81,777	2,59,572	9 14 11
Mysor	...		...	...	...	.....
Khurg	.....		.....	.....	...	...
Berar	13,863		403	3,197	3,600	0 4 2
Total	2,28,456	*Difference* between amounts shown in this Statement and Statement 21.	14,72,145	4,32,387	19,04,532	
Difference between amounts shown in this Statement and Statement 24. — Add (Panjáb)	10,442	Add (Panjáb)	89,092			
		Add (Burma)	22,792			
		Add (Mysor)	63,467			
	2,38,898	Add (Khurg)	8,295			
Deduct (Central Provinces) ...	28,527					
	2,10,371		16,55,791			

FORM 28.

Annual Account of Forest Revenue for the year 1870-71.

	Rs.
Receipts	35,76,079
Expenditure	30,65,610
Surplus	5,10,469
Add amount collected by District Officers in Bengal, not shown in Statement 21	58,535
Add difference between Assets and Liabilities at the commencement and close of the year	5,15,676
Net Revenue	10,84,680

Detail of Difference between Assets and Liabilities at the commencement and close of the year.

	At the commencement of the year.	At the close of the year.	Difference	
			In favor of the year.	Against the year.
Value of Timber and other stock	15,95,417	24,00,538	8,27,163	22,042
Outstandings on account of sales	6,04,308	3,99,181	1,79,261	3,84,388
Excess payments to Contractors	5,63,112	4,94,044	27,652	96,720
" " Permit-holders, Burma	28,803	45,000	16,197	.....
TOTAL ASSETS	27,91,640	33,38,763	10,50,273	5,03,150
Deduct difference	... .	.....	5,03.150	
			5,47,123	
Deduct liabilities	.....	.....	31,447	
BALANCE	... .	.....	5,15,676	

Revenue realised by the Forest Department during the past five years.

PROVINCES.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.
	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	50,555	75,687	2,24,546	1,13,753	61,143
N. W. Provinces	5,77,954	5,11,191	6,53,389	7,26,255	3,05,076
Panjáb	2,31,470	2,79,297	3,45,164	3,94,132	10,24,420
Oudh	2,01,246	66,453	1,31,822	1,06,922	60,181
Central Provinces	3,67,095	3,49,491	3,50,536	4,16,020	6,58,120
Burma	4,24,053	6,47,590	8,16,171	9,84,773	8,18,124
Mysor	2,66,020	4,10,012	3,51,476	2,95,218	3,37,669
Khurg	31,934	77,746	74,448	1,08,152	74,067
Berar	43,574	53,446	84,556	1,45,481	1,77,279
TOTAL ...	21,93,901	24,70,913	30,32,108	32,90,606	35,76,079

Expenditure incurred by the Forest Department in Conservancy and Working during the past five years.

PROVINCES.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.
	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	89,326	1,41,382	95,581	61,004	24,174
N. W. Provinces	2,28,186	2,04,249	3,10,303	2,95,969	5,41,957
Panjáb	1,76,950	1,75,920	1,93,515	5,55,375	10,31,201
Oudh	38,001	70,569	59,566	63,180	52,872
Central Provinces	46,817	1,13,068	1,86,925	3,65,801	1,95,251
Burma	2,04,591	2,25,049	3,22,981	3,11,404	2,89,469
Mysor	32,165	52,317	59,274	44,252	81,081
Khurg	4,425	5,354	6,552	22,851	14,822
Berar	.....	2,184	7,175	22,018	43,170
TOTAL ...	8,20,461	9,90,092	12,41,873	17,41,854	22,73,977

Expenditure incurred by the Forest Department on Establishments during the past five years.

PROVINCES.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.
	Rs.	Rs.	Rs.	Rs.	Rs.
Bengal	14,881	24,223	30,676	34,870	60,186
N. W. Provinces	83,711	85,139	1,01,475	1,27,441	1,33,928
Panjáb	78,680	97,955	1,15,828	1,58,279	2,04,607
Oudh	21,571	23,065	29,615	42,090	47,119
Central Provinces	81,041	99,031	1,07,730	1,08,445	1,12,182
Burma	80,544	1,03,339	99,191	1,10,058	1,10,566
Mysor	53,823	57,725	60,677	59,998	64,381
Khurg	7,127	8,610	9,301	10,231	9,777
Berar	13,718	16,157	27,553	58,692	38,887
TOTAL ...	4,35,096	5,15,244	5,82,046	7,10,104	7,81,633
Total amount of expenditure incurred on Conservancy and Working, and Establishments	12,55,565	15,05,336	18,23,919	24,51,953	30,55,610
Surplus	9,38,336	9,65,577	12,08,189	8,38,653	5,20,469

Note.—Had it been possible to include the cost of 84,000 sleepers delivered at Delhi by the end of June 1871 in the accounts of the year, the surplus for 1870-71 would have stood at Rs. 6,56,469, instead of Rs. 5,20,469.

104. It will be observed on comparing the tables of receipts and expenditure that while there has been a steady increase in the revenues, there has been a proportionate increase in the expenditure. The cash surplus stood at Rs. 9,00,000 in 1866-67 (which comprised only 11 months) and above Rs. 9,50,000 in 1867-68; rose to Rs. 12,00,000 in 1868-69, and then fell to Rs. 8,00,000 in 1869-70 and Rs. 5,00,000 in 1870-71.

105. The principle observed is to conduct operations so as to provide a continuous supply of timber for future generations; and is not so much to secure a growing income, as to husband the timber in the great forest domains of the State, which in themselves form a valuable stock of capital. Before the formation of a Forest Department, the standing timber was ruthlessly destroyed, which had the effect of producing an immediate gain, while it impoverished the resources of the future. The introduction of an organised system has checked this reckless destruction of valuable property, but necessarily has involved increased expenditure. The expenditure is incurred not only in carrying out conservancy measures, but in works of improvement, such as the demarcation of forests, the formation of plantations, the construction of roads, the opening out of streams for the transport of timber, and the like; all of which are necessary, and tend to increase the productiveness of the forests.

106. As a consequence of carrying out these measures of conservancy and improvement, there has arisen the necessity not only for enlarged subordinate establishments, but for the introduction into the Department of skilled and competent officers in the controlling, and in the lower ranks.

107. The great falling off in the cash surplus of the Department during the years 1869-70 and 1870-71 (*i. e.*, after deducting expenditure from receipts), is caused by the operations undertaken by the Forest Department to supply timber and fuel for the State Railways. The final orders for adjusting these transactions have not yet been issued, and the accounts therefore show large outgoings without any corresponding increase of Revenue under this head. The necessity of the greatest care, with constant supervision of the work in its minutest details, to prevent irreparable injury being done to the forests, has led to large increases of establishment, enabling the work to be spread over the forest tracts in such a manner as to prevent any one portion being unduly overtaxed in its productive powers.

Audit of Forest Accounts

108. By a recent decision of the Financial Department, the audit of Forest Accounts is now entrusted to Conservators, and is carried out departmentally in all the larger provinces, offices of account under an officer of the higher controlling establishment being sanctioned for the work. But, in order that no charge should be passed contrary to rule, as well as to enable the budget heads to be checked and the totals to be embodied in the provincial accounts, consolidated cash accounts, showing each item of revenue and expenditure in detail, are furnished from the Forest Office of Accounts, monthly, to Provincial Accountants General. As a further safeguard, Accountants General are authorised to inspect Forest Offices of Account. Formerly the forest accounts were audited by the Provincial Accountants General, but it was found impossible for persons who possessed no practical knowledge of the

work to exercise a really effective check on the expenditure of so special a nature as that of the Forest Department. The check now rests with the Conservator himself, who not being a disbursing officer, is interested in showing the financial action of the Department in the most favorable light possible. A mixed system, by which the working charges were audited by the Conservator, and the personal charges by the Accountants General, was tried for a short time, but given up as being unnecessarily complicated.

PART VI.

GENERAL.

Penal action of the Department.

109. The following table exhibits the number of cases which have been prosecuted in the different Magisterial Courts, whether of Forest or Civil Officers:—

PROVINCES.	No. of Prosecutions.	Convictions obtained or still pending.
Bengal	.....	.....
North-West Provinces	369	278
Panjáb	125	*Not known.*
Oudh	34	26
Central Provinces	308	174
Burma	71	58
Mysor	82	67
Berar	103	101
TOTAL ...	1,092	704

Remarks on the above

110. It will be observed that the above returns do not give the number of persons concerned in each prosecution, but only the total number of cases. Reference, however, to the table at the commencement of the report will show that the population of the provinces included in the above table amounts to upwards of 121 millions of inhabitants: the percentage of prosecutions, then, hardly exceeds 5 per million. It may be accepted, therefore, that laws which are violated by so infinitesimal a proportion of the population, do not press on it with any undue severity. When it is borne in mind that the officers of the Department who have to commit these cases have not, except in a few instances, had the benefit of any judicial training, the percentage of convictions to prosecutions does not appear unfavorable. Moreover, in those provinces in which the greatest number of forest officers exercise magisterial powers, and where, except in serious cases, it is not necessary to bring the offenders before the district courts, the percentage of acquittals tends to prove that a fair hearing is given to all persons brought to trial. As the system of giving magisterial powers to the forest officers seems to work well, it is to be regretted that this is not more generally granted by the local Governments. In all cases the right of appeal lies to the Magistrate of the District, which should be a sufficient safeguard, as far as the people are concerned. All cases, too, decided by forest officers are, or should be, included in the monthly returns of the Magistrate of the District, which brings them under the supervision of the High Courts, thereby ensuring regularity of procedure. On the other hand, great inconvenience and delay of work arises where these magisterial powers are not given, from the necessity of the forest officers having to go often long distances to carry on prosecutions in the District Courts; indeed their work often renders their presence impossible, and many offenders and trespassers, who well deserve punishment, thereby escape.

The Forest Act.

111. Some progress has been made towards obtaining the opinions of local Governments on the Forest Act; some, however, are still wanting, and actual legislation is therefore at present impossible. In the Panjáb, the original forest rules have been legalised, the rights of waif on the rivers defined, and a set of rules drawn up and provisionally sanctioned for Chamba. Amended sets of forest rules have also been published for Bengal, Khurg, and Haidarabad.

112. With a view of introducing a uniform system of keeping accounts and records in the Forest Department, a draft Forest Manual has been prepared, under the superintendence of the Inspector General of Forests, by Captain Stenhouse, Officiating Conservator in Oudh. This code, previous to being issued, is in circulation among the officers of the Forest Department in the various provinces for any suggestions and emendations that may be offered. There was an absolute necessity for the introduction of a more uniform system of keeping accounts, recording papers, &c. In some provinces papers were packed in files, in others in bundles, frequently endorsements were either insufficient or altogether wanting, and the universal complaint of officers succeeding to the charge of forest divisions was, that the records were incomplete and in confusion. *Forest Manual.*

113. In considering the component parts of the forest establishment, it must be remembered that the Department has been gradually built up within the last 12 years; that it was not organised on any recognised plan, but according to the particular views of each local Government; the same class of officers engaged on the same duties were called Deputies in one province and Assistants in another, without reference to the pay they drew; in some provinces medical men possessing a knowledge of botany were selected for appointments in the new Department; in others, the choice fell solely on military men, who, beyond a turn for sport and camp life, had no peculiar qualifications for the duties of forestry in other provinces; again, ordnance conductors or civilians of an altogether inferior class obtained posts in the Department. It is a matter of wonder that, in a Department so formed, the proportion of good and thoroughly efficient officers should be as large as it is. Several officers no doubt were ill-chosen; their habits, life, or physical power unfitting them for a rough solitary life in the jungles; many moreover were admitted into the Department at an age that precluded them from all hope of ever reaching the more advanced ranks, and which did not leave many years of active service for the benefit of Government; in short, no rules for admission into the Department existed, and the hap-hazard state of things which was soon arrived at, showed the necessity of consolidating the officers of the provincial establishments in one general list under the orders of the Government of India. This was accordingly done in October 1869; the Department was then divided into three classes of Assistants, Deputies, and Conservators, with grades of pay ranging from Rs. 250 to Rs. 1,600 per mensem. *Controlling Establishment.*

114. Although the admission in India of candidates to the Forest Department has not been absolutely prohibited, yet it has for the present virtually ceased, owing to the Secretary of State having sanctioned the selection in England of a number of young men who, after being trained for 2½ years in the Continental Forest Schools, are sent out for service in India. The numbers of young men thus selected and trained, who have either come to India or will shortly arrive, are as follows:—

			Numbers selected.	
1869	...	...	7	(one since dead.)
1871	...	...	8	
1872	...	...	12	
1873	...	...	9	
1874	...	...	4	
		Total	... 40	

The education of these candidates will have cost the State, including outlay on examinations, about £16,000, up to the date of

their arrival in India. These candidates are admitted by competitive examination at the India Office, after which 2½ years are spent in studying the system of forestry on the continent, either in Germany or France. For the present this system of admission will probably continue, but eventually the controlling staff of the Department will perhaps be recruited more from the subordinate establishments, and by young men trained at the Engineering College in England.

Education of Forest Officers.

115. The great importance of attending to the education and training in forest matters of the young men entrusted to their charge cannot be too strongly impressed on Conservators and others. Too often the necessities of work make it necessary to keep the young officers stationed in some distant locality, where, after a hard day's work in the forest or on the river, they have little leisure, and naturally little inclination, for study. Every opportunity should be taken during the slack season of enabling them to go where they can obtain instruction; a better knowledge of the vernacular than many of them possess being most desirable, and a point on which Government will insist. At present, with the view of educating officers in topics connected with the administration and interests of the Department, copies of all important forest reports and other papers bearing on forest subjects are furnished to all local Governments, and it is the duty of the Conservators to see that these are regularly circulated from the head office among all the officers of the Department in the province, that every facility may be given for the study of, and consequent familiarity with, all forest questions of interest. Government will always be glad to encourage such a course of study by the supply of books on departmental subjects whenever they are asked for.

Employment of natives on the controlling establishment.

116. The attention of Government has lately been much directed to the subject of the employment of natives on the controlling establishment; it is a question that now arises in all branches of civil employ, and the same arguments which have been repeatedly urged for and against it are perhaps of more weight and importance in this particular branch of the service than elsewhere, the temptations to which the men are exposed, and the difficulties of thorough surveillance being greater. The class of men attracted by the style of service is not the best for the purposes required. The high standard of education necessary is not (with rare exceptions) found combined, amongst natives, with the active habits and physical fitness, without which it is impossible for a man to carry on the duties of an Assistant or Deputy Conservator. The experiment of sanctioning 12 Native apprentices has been tried; they will be educated partly in the forests and partly at Rúrki,—a scheme of education which perhaps gives better hope of ultimate success for them than any other that could be adopted.

Subordinate establishments.

117. The subordinate establishments are generally too weak in numbers to be efficient; but, considering the revenue now realised by the Department, any increase in their staff is at present difficult. Moreover, the rates of pay sanctioned for the subordinate establishments are not sufficient, in most of the provinces, to attract natives of the required stamp, and here as in the higher ranks we are met by the difficulty of securing the services of men fitted both by their degree of education and their physical qualities to discharge the duties required of them, and to lead at the same time active and rough lives in the forests.

Necessity for the Establishment of Vernacular Schools.

118. The best way of meeting this difficulty would be the establishment of vernacular schools in the forest districts, where the children of the inhabitants would receive a simple but useful style

of education, while their natural habits of life would fit them for work in the jungles. Such schools, wherever they exist, merit the strongest support from forest officers, and indeed from all Government officials.

Enumeration of officers specially deserving commendation

119. Among the Conservators, the thanks of the Government are due to Mr. Baden Powell, both for his administrative services and for the advantage which his legal knowledge has been, not only in his own province, but also in the general work of the Department, with regard to the preparation of the Forest Act and the Burma Forest Rules; also to Captain Seaton, in Burma, and Mr. Greig in the North-West Provinces. Among the Deputy Conservators, the names of Messrs. Jacob, O'Callaghan, Graham, and Ribbentrop deserve notice. Mr. Jacob officiated for two years as Conservator in the Central Provinces, during which time he did much hard work in a large and unhealthy province. Mr. Graham in Burma, and Mr. Ribbentrop in the Panjáb, have both been brought to the notice of Government for their services in the plantations. Mr. O'Callaghan has been very successful in carrying on the sleeper works for the State Railways. Among the Assistants, Mr. Duff, who has lately been appointed a Deputy Conservator, deserves special commendation for the tact and judgment he displayed in settling questions appertaining to forest rights, as well as for his active personal superintendence of his division.

120. But to no officer in the Department would the thanks of Government have been more due than to the late Lieutenant Lillingston of the 11th Hussars, who, during the short time he had charge of the Tonse Division in the North-West Provinces, (which from peculiar circumstances was at that time as difficult a division as it could have fallen to the lot of a forest officer to hold), showed an amount of zeal and devotion to the service, which gave promise of his becoming one of its most valuable officers. His untimely death by an accident in the forests is equally to be deplored by the Department and the Government.

General remarks.

121. The foregoing is a short sketch of the past history and present state of the Forests and the Forest Department in British India. It had been my intention to have made my review on this subject much fuller, but the impossibility of taking about, when on tour, all the necessary books of reference, and the difficulty and delay in obtaining many data indispensable for an exhaustive report, have obliged me to curtail my first programme. Added to this, the extreme difficulty of writing a review while constantly travelling, inspecting forests and forest establishments, while at the same time the current work of the office has to be attended to, all combined to render the writing of the review I had undertaken during the present season more onerous than I had anticipated. But these difficulties must always attend the publication of a general forest review, as there is a practical difficulty in obtaining the provincial reports before the inspection season commences, and it would be most undesirable to delay the issue of the review till the Inspector General's return from tour, involving, as it would, the lapse of a whole year since the expiration of the period under review.

122. The review may be usefully concluded by the following epitome of an article from the *Revue des deux Mondes* on the reserve supply of timber in Europe.

The reviewer commences by drawing attention to the fact that "one of the most serious deprivations to which an industrial state of society can be subjected, would be a scarcity in the supply of timber of workable dimensions; that, although it requires one, or

even two centuries to produce a full-grown tree, at the present time more timber of large scantling is consumed in Europe than is being produced." He quotes the maxim of Colbert (laid down so long ago as 1669, but still adhered to in the *Code Forestiere* of France), that "in the State forests, in those belonging to the communes, or to any public body, no oak tree should be felled before it has arrived at maturity, *i. e.*, when no further improvement in the tree can, during the next thirty years, be looked for. To a strict unvarying adhesion to this rule, during the next century, must France look to ensure to herself the supply of timber which she will assuredly need. Since the end of last century, the rate of consumption of timber in France has greatly increased; up to that time the production exceeded the consumption. Now the case is reversed; the rise in prices has led to the sale of all available timber belonging to private parties to such an extent, that full-grown trees in private forests have almost entirely disappeared. Even to many forests belonging to communes the same injury is being done, though more slowly, while State forests are continually being reduced in area by repeated alienations of land suited for the growth of large timber. At the commencement of this century, trees 12 feet in girth, were common, now they are rarely met with in the forests. While this diminution in production increases, so do, day by day, the requirements of the timber trade. How are these requirements eventually to be met? During the last fifty years the rate of consumption has at least doubled, and France now imports more timber than she produces. In England scarcely any large trees remain excepting those which are carefully preserved in her public and private parks. She imports twice the amount of timber that France does, of which her colonies furnish scarcely a moiety. Holland and Belgium, possessing hardly any woods of their own, are obliged to import largely from all parts of the world. North Germany, though rich in forest lands, allows the forests to be worked at too early an age. The Austrian forests, rendered accessible by the completion of Railways, can now send their produce to the market; the vast forests of Croatia and Sclavonia have fallen into the hands of speculators who will soon make a clean sweep of their timber. Within the last five years, too, the noble forests on the Upper Save river, and on the Julian Alps, have been sold to companies who have purchased them on speculation at 220 francs per hectre (2½ acres), with the view of realising the utmost profit they can on the sale of the timber. Spain, Italy, and Greece are almost entirely denuded of anything worthy the name of *Forests*. The woods of Mount Etna (of old historical reputation, from which the mountain derived her name of Nemorosa), covering two and a quarter millions of acres, abounding in oak, chestnut, beech, birch, and pine, have been, since the sixteenth century, undergoing a system of steady gradual destruction, not yet quite completed. Italy, whose surface bristles with mountains, possesses hardly 1,250,000 acres of miserable forests to supply the wants of 25 millions of inhabitants. In Russia the forests have been long worked and impoverished by every kind of abuse and now the railways threaten rapidly to use up the few remaining trees. In the steamers plying on the Volga wood only is used for fuel. Norway, Sweden, and Finland seem at present to furnish all the countries along the shores of the Atlantic with pine timber; not only is it exported by millions of cubic feet to England and France, but Rio Janeiro itself is built of Norway pine; and even Australia and India claim their share of the supply. In northerly climates the growth of timber is at least five times slower than in France or any more southerly

latitude; while the consumption per head for the number of the inhabitants is at least five times greater: this, joined to the present rate of export, must exhaust the forests at no very distant date."

"In Europe the difficulty of obtaining wood by importation from the other continents must soon be increasingly felt. England already imports annually many millions of cubic feet of timber from her American possessions. Chicago, a city of 300,000 inhabitants, which has already become, on Lake Michigan, a port equal in importance to Marseilles on the Mediterranean, drains yearly from Canada more timber than France imports from all foreign countries put together, that is, more than half of all the timber annually used in France. This timber again is exported to the Prairie States, which possess no wood, *viz.*, to Illinois and Indiana. The late destruction by fire of Chicago may be considererd a warning against the almost exclusive use of wood in house-building. Nevertheless the re-construction of the ruined city will of course greatly increase the demand for large timber. By the St. Lawrence yet more is carried to New York and the eastern coasts of the United States. The great forests of South America, extending from the Amazon to Paraguay, hardly export any wood; their extreme unhealthiness rendering the working of them almost impossible. Moreover, in these vast tropical forests the useful sorts of timber are much more rarely met with than in the woods of colder climates. San Francisco is so denuded of timber that the iron works of that region are actually lying idle for want of proper fuel. Further in the interior, the temporary clearings made by the coffee-planters have half ruined the forests. Some of the finest forest tracts on the earth's surface seem to be disappearing without their produce ever having been seen in the markets of the world. Of all descriptions of timber, the most useful is the oak; equally serviceable in carpentry, upholstery, cask-making, and carriage-building; it is necessary, too, for house and ship-building, and for railways; in certain branches of trade, as for instance in the making of wine-casks, no other wood can supply its place; for all these purposes the French oak is unequalled. African and American oak can in no way be compared to it; the former being far more difficult to work, besides being more liable to warp and split, while the latter is far less durable. But the supply of French oak seems threatened with exhaustion. When France was conquered by the Romans, her forests from the Rhine to the Pyrenees covered a surface of 100 millions of acres; now she hardly possesses 20 millions of acres of forest lands. Besides the enormous amount of timber required for ship-building, there is the still greater demand of the wine trade. France manufactures yearly from 50 to 70 millions hectolitres (one hectolitre represents 22 gallons) of wine and brandy for home consumption and foreign export. It is a fact worth noticing, that the wine trade in France makes five or six times greater demand on the market than does the Navy. For all this wine, oak casks are absolutely essential. During the twelve years previous to 1857 about 20 million pieces of cask-staves were annually imported into France. In 1866 the importation of these pieces for cask-staves had reached to 63 millions, and it seems probable that as steam facilitates a wide development of trade, so will this branch of demand yearly increase. During the last 30 years the price of oak timber has just doubled itself; and while the call for it increases, and the 'sources of supply decrease, it is evident that the price must rise 'almost without limit."

Now as to the best methods of meeting a crisis that seems inevitable, the reviewer proposes, "first, that with the view of economising her own supply of oak, France should import all the foreign timber she can procure, using her own as little as possible; secondly, that the system of mixed coppices (a system well known to all who have had the treatment of forests to attend to), should be encouraged in all private, and absolutely practised in all State forests. By this system eight or ten standard trees would be allowed to remain per acre, and an amount of mature timber would be ensured to meet the future demands of the country.

"It would be well if attention were more generally drawn to these undoubted facts, touching the prospects of our timber supply, the general diminution of serviceable wood being a question which must affect all countries, and none will suffer more than England and her dependencies should the matter not be taken up in time. The truth of the impending difficulty is perhaps not sufficiently believed in; the greatly increased demand made by the inventions of modern civilisation on the timber market are forgotten. These demands are indeed met for the present, but there is a future to be provided for."

123. The lesson then to be learned from the above by all to whom the management of the mutilated Forests of India is entrusted, should be that the main object of their work is not so much to see how many trees can be brought to market and sold for the enhancement of forest revenue, as to so sparingly work and husband their resources that, while providing for present wants, the demands of the future are never forgotten; on the contrary, the requirements of future ages must be kept constantly in view, and all forest work should be carried on with primary reference to them. It is only by such a system of management that our Forest Department can accomplish its real objects; otherwise it will do more harm than good to the country, and will only prove a useless drain upon its Revenue.

APPENDIX A.

REPORT RESPECTING THE PANJAB FORESTS.

It is a matter of great regret to me that the particulars of the Panjab Forests should be furnished at the present time, when the work of demarcation and survey is not sufficiently advanced to enable me to give anything beyond a rough guess at the *area* in most cases.

SECTION I.

AREA OF STATE FORESTS.

(*A*) *State Forests.*

(*B*) *State Forests leased.*

(*A*)—The State forests in the Panjab consist of—

(*a*) Forests in Kullu and Parbuttí Valley;
(*b*) Forests in Kangra District;
(*c*) Forests in Hushiarpur District;
(*d*) Forests in Gurdaspur District;
(*e*) Forests in Hazara;
(*f*) Forests in Rawal Pindee;
(*g*) Forests of fuel trees in the plains, called Rakhs or Bérs;
(*h*) Forests of Kalisar, in the Amballa District;
(*i*) Artificial Plantations;
(*k*) Kachhi *Shisham* Forests;

Of these (*a*), (*g*), (*h*), and most of (*i*), are fully demarcated with stone piles or masonry pillars. In (*b*), (*c*), (*e*), (*f*), demarcation of part of the forests has been effected, and is still in progress.

In (*d*), the new settlement has furnished an opportunity for revising the area and status of the forests; but the result of enquiry shows that only the standing trees belong to the State, and that the forest area is so interspersed with private lands and cultivated plots that demarcation will be impossible, and all that can be done is to prevent the felling of trees.

(*a*)—The Kullu Forests, including those on both the Bias and Parbattí, are 28 in number, and the area is 2,241 acres.

(*b*)—The forests in Kangra are estimated to aggregate 365,000 acres, from which the State forests are not yet separated.

(*c*)—Hushiarpur—There are two forests of *Chil*, (Panjal, and Lohara,) two of *Bamboos*, (Bindraban, and Karupur.)

Aggregate of *Chil*	... ...	4,000 acres, taken over up to date.
" of *Bamboos*	... ...	5,690 acres.
Total	...	9,690 acres.

(*d*)—The area of the Gurdaspur Forests is not yet known, but is believed to be

(*e*)—In Hazara, one range only has been surveyed, *viz.*, Dungagali, giving $\frac{41,023}{64 \text{ miles}}$ acres of demarcated, reserved forest; the area of un-demarcated forest is not known.

(*f*)—In Rawal Pindee, the area of the demarcated forest tracts, as distinguished from mere fuel reserve, is 239,109 acres.

(*g*)—The area of "Rakhs" mostly demarcated, except those in Rawal Pindee and possibly others (on the frontier), is as follows (by districts):—

			Acres.
Under Forest Department,	Lahor	... ...	271,701
" "	Amritsar	... ...	2,895*
" "	Gujranwala	... ...	153,060
" "	Ferozpur Mamelot Rakhs	... ...	20,375†
MULTAN ...	Under Forest Department ... 59,958; Under District 17,915	...	77,873
MUZAFFARGARH ...	Under Forest Department ... 73,051; Under District 918,680	...	991,731
MONTGOMERY ...	Under Forest Department ... 500,000; Under District 1,914,961	...	2,414,961
JHANG ..	Under Forest Department ... 72,589; Under District—enormous area of unmeasured waste.	...	72,589
			4,005,185

* Including 'Seral Amanat Khan,' treated by the Plantation Division, and restored to the Fuel Reserve Division.
† Described in Proceedings, November 1867, No. 26.

Brought forward			4,005,185
Dera Ghazi Khan			Not known yet.
Dera Ismail Khan			411,714
In course of transfer, Hazara Rakhs			Not known yet.
Rawal Pindee	Under Forest Department	245,656	282,343
	Under District	36,687	
Gujrat (Forest Department)			66,264
In course of transfer, Jhilam			328,718
Shahpur Forest Department—14 Salt Range Rakhs			63,438
Under District Jallandar			1,182
" " Amballa, about 2,000 acres, inclusive of *forest*: the total in the return is			11,829 Acres.
" " Dehli			3,573
" " Karnal			4,638
" " Hissar (in one Bér, as locally called at Hansi, being a grazing common only)			1,902
" " Rohtak			11,422
Total			5,192,208

(*h*)—Kalisar Forest is a *Sâl* forest, about 20 miles from Jagadri, in the Amballa District; a portion was given up to the villagers of Kalisar, and the rest is owned jointly by Government and the Pathan Jaghirdars of Khizrabad, who divide the proceeds. It is 10 miles in length, and the greatest breadth of the forest is 5 miles, diminishing to about 1 mile:—roughly its area may be estimated at 15 square miles, of which about 3,000 acres is covered with *Sâl* trees of inferior growth, the property of the State.

(*i*)—The area of plantations completed at close of 1870-71 was—

		Acres.
MULTAN LINE	Changa Manga (Vân Khara Circle completed)	5,668
	Montgomery (Sakh Ravi, &c.)	600
NEAR LAHOR	Khanwa	420
	Tira	660
	Rodshah	270
	Jugian cum Shadira	900
NEAR AMRITSAR	Nâg	500
N. S. RY. CIRCLE	Chinâb Sailaba	just begun.
	Ludhiana	200
	Phillaur	240
	Dehli	800
	Pilaurí	477
	Jallandar	50
	Alma (Naushera Island on Bias)	858
		11,643

(*k*)—The area of the Kachhí Forest is 3,616-1-32 acres, containing 55,156 trees, about one-third being under 4 feet in girth.

B.—The *leased* forests are—

(1)—Chamba State, on the Chinâb and Ravi

(2)—Bassahir State on the Satlaj, including three forests belonging to the Poari Wazir, subordinate to that State.

The *Chamba* forests have just been re-examined, and are in course of survey and of classification into two classes, reserved and unreserved; demarcation and survey are in progress, and only guesses at area can, at present, be made.

The forests on the Ravi and its tributaries, the Siul and Bhandul, are estimated at 50,000 acres, thus:—

Barmaor district, above junction of the Tana Budhil and Ravee rivers	20,000 acres.
Valley of Ravi proper, below the junction	7,000 "
Valley of Bhandul	7,000 "
Valley of Siul and tributaries	26,000 "
	50,000 acres.

Below the Ravi valley, there is the Kalatop forest now fully fenced, demarcated, and being systematically worked, containing about 3,000 acres. There are also the selected forests of Baniket, and those near the cantonment of Buklo (all *Chil*), which are being planted and are fenced and demarcated, but are not yet surveyed, and are estimated at about 8,000 acres.

The Chinab forests extend along the Chinab river for 48 miles, and along 13 miles of its tributaries.

The reserved forests are not all surveyed as yet, but we have the following results:—

		Area.
Number of forests *reserved*, surveyed, and demarcated	50	22,033 acres.
Number of forests reserved, but not yet surveyed	16	8,000 " estimated.
Area left for *unreserve* and forest rights, &c.		3,000 " "
		33,033 acres.

The *Bassahir* forests.—These extend along the right and left banks of the Satlaj; also on certain smaller nullahs running into the Satlaj (these are as yet imperfectly known); also the forests on the Baspa, the largest tributary on the left bank.

They have not been surveyed, but are estimated thus :—

	No.	Estimated area.
Left bank, including the Poari forests	25	8,500 acres.
On the Baspa	7	1,800 „
On the right bank, Pandrabis district	7	2,500 „
On the right bank, above Pandrabis, including one forest (1¾ sq. mile). On the right bank, tributary, Wanga	16	5,300 „
		18,100 acres.

SECTION II.

The Chief Towns and their Supply.

There are at present 32 districts in the Panjab; in most of these the principle was adopted at settlement of leaving for every village a waste area equal to twice, and in some cases three times the cultivated village area: hence nearly all the supplies for towns and villages are derived from waste or rakh lands at greater or less distances, and which produce stunted trees and brushwood suitable for fuel.

The *cantonments*, where there are centres of the Commissariat Department, and the large cities, alone need reference; they are as follows :—

Peshawar, cantonment and city ...	Only recently a regular settlement has been set on foot, and there are no demarcated rakhs; but the frontier tribes of Affridis and others bring in fuel from jungles in the neighbourhood.
Kohat, small cantonment ...	There are also un-demarcated and practically unknown jungles, such as the "Phulahi" (*A Modesta*) jungles of Kwara, which at present yield an abundant supply.
Abbottabad (Hazara district, small cantonment).	Ditto ditto ditto.
Bunnu (Edwardesabad, small cantonment).	Ditto ditto ditto.
Dera Ismail Khan, cantonment and city; Dera Ghazi Khan, cantonment and city.	Abundant supply from large area of rakh land, some of it finely wooded (for that class of wood) with Jhand (*Prosopis Spicigeon*) and *Tamarisk*.
Rawal Pindee, large cantonment city, centre of commissariat, gas-works, postal carriage, workshops, &c.	There will be great difficulty ere long in meeting the supply. There are extensive forests of "*chil*" (*P. Longifolia*), in the hilly portions (Marri and Kahuta Tasils), with a good deal of brushwood in Pindighola and Fatteh Sing Tasils. They are just now being brought under systematic management. *Principal demand.*—'*chil*' timber from the above forests, and '*P. Excelsa*' brought from the Hazara forests beyond Marri sanitarium (60 and 70 miles). Fuel from Pindee rakhs, and also from the Hazara forests, principally *oak* and Pavia (*chesnut*).
Marri, sanitarium, with military depôt, and troops at works on roads beyond.	Locally supplied, forest and grazing ground being all round.
Jhilam, cantonment and city ...	Timber from Forest Department and other depôts on river close at hand. Fuel and grass from rakhs of the district.
Shahpur salt mines, and Pind Dadun Khan.	From neighbouring rakhs, but the supply is scarce.
Lahor, city (about 95,000 inhabitants), railway workshops, &c., and Mianmir cantonment.	Supply of timber from Ravi river depôts, firewood from Government and communal waste lands at greater or less distances.
Ferozpur, arsenal, cantonment, and city.	Supply of timber from Satlaj, and firewood ditto.
Amritsar (largest city in the Panjab), railway workshops, and cantonment (small).	Timber from Lahor (Ravi) depôts, and from Bias; firewood mostly from private lands in Amritsar, and from the few rakhs that remain; but fuel is brought in from neighbouring districts by carts, *chil* charcoal, and others from Gurdaspur and Hushiarpur.
Madhopúr, workshops and saw-mills ...	Timber from Ravi depôts close at hand; charcoal from forests about Dhar in Gurdaspur (*chil* charcoal principally.)

In the Amritsar division the remaining large towns Batála and Dinanagar (Gurdaspúr district), Sialkot (Sialkot district), with cantonment, are locally supplied from fuel lands.

Jallandar, city and cantonment ...	Timber from Philor on Satlaj, and locally for kinds other than coniferous. Fuel, from the fuel rakhs that remain from a large rakh in Kapúrthala territory called Phagwara, &c.
Hushiarpúr, city and formerly cantonment	Local supply only.
Kangra, city and forest, with Dharmsala cantonment and hill station, and Nurpúr (formerly military station).	
Kashmír, population and shawl trade	Local supply from neighbouring forests.
Philor, fort and railway works ...	On Satlaj. Local supply of fuel; charcoal imported.
Ludhiana, city	River Satlaj for timber. Local supply for fuel. Zemindars have here grown fuel in about 82 villages.
Amballa, city and cantonment ...	River Satlaj for timber. Fuel in the lower hills skirting the district.
Jagadri, large town with considerable trade.	Ditto ditto ditto.
Rupúr, canal works ...	Ditto ditto ditto.
Dehli, cantonment and city, and Jumna canal works.	Fuel partly from private waste lands, and from the few rakhs that remain. Timber from North-Western Provinces.

I can give no information about the towns in the Hissar division, such as Rohtak, Sirsa, Hansi, &c., as there are no forests or fuel reserves near them. There are vast areas of waste land, however, in these places.

SECTION III.

Railways, (including State and other Railways.)

The principal Railways are—

(*a.*) The Lahor and Multan line } Guaranteed.
(*b.*) The Lahor and Dehli line }
(*c.*) The Lahor to Jhilam, or Northern Panjab (State) Railway.
(*d.*) The Indus Valley line.

(*a.*) This line has now no great demand for timber, but it purchased in former days timber from the Chinab and also from the Bias. On the Satlaj, the principal demand was met from sources belonging to the contractors, Brassey, Wythes & Co., they having purchased all Mr. Arratoon's logs in the river as well as a grant of 8,000 trees in the Satlaj (leased) forests made to that merchant by Government.

The fuel demand was met by a contractor at Lahor, who purchased large areas of Government "rakhs" for clearance, on an estimate of contents made by a forest officer. As this resulted in a total denudation of all the fuel lands near the line, the Panjab Government raised the rates of fuel near the line, which has had the desired effect of driving the contractor to seek his supplies from private and village lands, the conservancy of which is impossible.

(*b.*) The large plantations at Changa Manga together with the finely wooded reserves of the Montgomery and Multan districts, will be the main source of supply from the line between Lahor and Multan, and Lahor and Amritsar. At present there are the rakh lands of the districts of Lahor and Montgomery. Below Amritsar the supply is obtained at high rates (Rs. 30 to 45 per hundred maunds) from private lands through a contractor; towards Amballa the Raja of Naba (whose territory embraces a large area of low hills bearing fuel trees in considerable quantities) supplies the market, and recently the fuel lands of Kalisar have been worked by the State, the material being taken down the Jumna canal on rafts to Jagadri.

(*c.*) The Northern State Railway has been supplied with timber from the three rivers, Chinab, Ravi and Jhilam; the Government supply having been aided by considerable purchases (to the amount of more than 870,000 cubic feet, costing Rs. 8,91,212) so as to save the Government forests from over-felling.

Fuel at present for construction works, chiefly brick-burning, has been got almost entirely from the rakhs of Lahor, Gujranwalla, Gujrat and Jhilam, but latterly private lands have been indented on, which being nearer the line can furnish supplies at a less cost. Up to the end of 1870-71, Government fuel lands supplied 4,64,063 maunds of fuel, having also 2,31,908 maunds in depôt awaiting delivery.

(*d.*) The Indus Valley Railway has not yet commenced to have a regular supply, but the line from Multan to Bahawalpur will, it is believed, be supplied principally from the Satlaj forests, and those of the Bias. The Northern State Railway Saw-mills are however preparing sleepers for this Railway at Jhilam, Kuthala (Chinab) and Lahor (Ravi) for

transport to Multan. Above 1,09,000 cubic feet of *deodar* have also been purchased from the Native merchants on the Swat and Kabul rivers, at about 14 annas per foot, for transport *viâ* the Indus to the works of this Railway. The fuel supply is entirely met from fuel reserves near the line in the Multan district, but as we have been careful to prohibit felling near the line, so as to reserve a good area against the day when the line begins to work, private lands in the district are at present chiefly indented on. The main fuel consumption is at the Satlaj bridge works.

SECTION IV.

Position and Composition of the Principal Forests in the Panjab.

(*a.*)—*State forests* (*reserved and unreserved.*)

Following the list given in Section I.

Kullu and Parbatti.—These forests consist of *Deodar*, and a good deal of kail (*P. Excelsa*). They lie principally on the bank of the Bias, and on its tributary the Parbatti. The Seoraj district of Kullu has, however, some *deodar* and *kail* forests on the Tirth and other streams, which ultimately run into the Bias, and can only be utilised by local conversion of the timber into sleepers or scantling. Higher up, on the slopes, large forests of *Picea Webbiana* (silver fir) occur, though from the inferiority of this class of timber, they have not hitherto been utilised. The deciduous trees are not important enough to be noticed.

Kangra.—These forests are almost all chîl (*Pinus longifolia*) with tracts covered with brushwood likely to be soon useful, along the Bias and the Chakkí; there are some good bamboo tracts in the Núrpúr tehsel, and a small block of *sâl* forests (70 acres) at Andreta near Baijnath, this being almost the last forest of this species to be found so far west.

Hushiarpur.—Except a few little patches of indifferent *sâl*, the forests are of *chíl*, and two forests (Korupúr and Bindraban) of *bamboos;* they are situated on the slopes of the Sub-Himalayan range known as the Sola-Singí Hills.

Gurdaspur.—Are entirely *chíl* of little value and so laden with forest rights and interspersed with cultivation, that nothing remains to the State but to protect the trees. The only important tract is situated along a range of hills of sandstone and marl known as the Nâghdâr, and which are seen from the road at Dalhousie from Dhâr to Danira.

Hazara.—These forests lie in three well marked ranges, the first, *Dungaguli*, is just surveyed, and contains 41,000 acres of reserve, and an unknown area of scattered unreserve. These forests are of *Pinus excelsa*, with patches of *deodar*, and some forests of *chíl* on the lower slopes, and of *P. Webbiana* on the higher ones; the road of export is on the great road from Marri to Abbottabad, and the forests follow the hills known as Dungagali, Mochpúra, Mián Ján, so far as the base of the Thandíani range. Beyond this there are the forests of *chíl, excelsa*, and *deodar* in the glens of Kônsh and Bhogarmang (Siran river) and Kâghán, none of the latter being yet surveyed. Kâghán being the principal *deodar* locality with forests of *Pinus excelsa*, has been worked, and is under the protection of this department; the produce is launched into the Kunhâr river, immediately below the steep slopes, on which the forests are nearly always situated, and thence reaches the Jhilam. These forests and the first-named range have been excessively worked and injured, and it is only now that a regular survey has been made and rules drawn up. I hope that a regular working plan will follow when an officer can be detailed for the work; without it the forests so largely drawn on by the Marri station and depôt and the military posts on the road, cannot much longer meet the demand.

(*f*).—*Rawal-Pindee.*—The whole of the forest tracts were originally called rakhs and divided into three classes. Class I was the forest properly so called in the hill tehsels of Marri and Kahúta, and to this alone I refer. These tracts, which form 99 per cent. of the whole area, are now to be regularly demarcated; the reserved demarcated portions not exceeding 30 per cent. of the whole area, and thus enabling us to preserve carefully, as the hitherto unrestricted right of grazing and tree-lopping will henceforward utterly cease in the reserved area. These tracts, as supplying the great cantonment of Rawal Pindee, are of increasing importance. They are principally *chíl* with tracts of firewood below the *chíl* slopes, containing Sanatta (*Dodonoa Barmauniana*), Bebikar (*Adhatoda Vasica*), Phulahí, (*Accacia modesta*) *olive*, species of *Ficus* and numerous others. In the higher ranges are also *Pinus excelsa, oak* (chiefly stunted) *yew, hill toon*, &c. Class II are *rakhs* and fall under the next head. Class III are mere grazing commons.

(*g.*) For a description of these "rakhs," see Economic Products of the Panjab, volume I, page 549. There are excellent notes published in the Selections of the Records of the Government, Panjab, Department Public Works, No. I of 1868. The plains yielding fuel are generally in their greatest extent towards the centres of the Doabs, or divisions of land between two rivers. The northern rakhs contain chiefly Phulahi (*A Modesta*), Kas (*Olive*), Sanatta (*D. Barmauniana*), Pataki (*Gymno sporia Spinosa*), Karil (*Capparis aphylla*).

The central Panjab rakhs contain Kikar (*Acacia Arabica*), Jhand (*Prosopis Spicigera*) Karil (*C. Aphylla*,) Pilil (*Salvadora Oleoides*), Bér (*Zizyphus*); also Dhak (*Butea Frondosa*).

In the southern Panjab rakhs, many of the same species occur, with Reru (*A Lencophlœa*) Bahn, (*Populus Euphratica*) and *Tamarisk*. These rakhs yield fine grazing besides the trees. The trees are, in exceptional cases, fit for timber, but mostly (though often of considerable size) stunted, gnarled and knotty. Pre-eminent for these qualities are the Jhand, Phulahi, and Reru. Rakh production is generally effected by cutting close to the ground for coppicing.

The produce varies exceedingly from the scantily-clothed ravines about Gujrat and Pind Dadun Khan, yielding hardly 5 or 10 maunds an acre, to good rakhs of 200 or 250 maunds. Such a rakh is No. 25 of the Montgomery district containing Jhand (*P. Spicigera*).

The rakhs yield scantily other products. There are species of *Salsola* for camel grazing, yielding also *Sajji*, or soda when burnt, the equal adaptability of the plant leading to competition for its purchase between camel-men and soda-burners; there is also the Kokan Bér and Mallapatr generally sold together, being the berries and leaves (valued as fodder) of the *Zizyphus Nummularia;* Manj grass is useful for ropes, screens, and cane-work, and Gul Kesu the flower of the Dhak (*Butea Frondosa*) used in dyeing; the large leaves of this last-named tree are also used by sweetmeat-sellers, grocers, and others, for wrapping their goods on sale.

(*h.*) The *Kalisar* forest is situated in a small Dún, or valley, 20 miles beyond Jagadri in the Amballa district. The forest is of *Sâl*, which never grows larger than suffices to furnish a stout pole for roofing purposes; and also frequently grows stunted and crooked, leaving no option but to convert it into firewood. The level part or bottom of the valley is a mass of boulders and pebbles intersected with ravines, which, in the rainy season, become torrents; the hills closing in on either side are covered with various deciduous trees and underwood, the *Sâl* not extending far up the side. A broad side, cut clear of wood and bushes, marks off the half of the forest which belongs to the land-owners of the Kalisar village.

(*i.*) Artificial plantations have been fully described in circular 17 of the Government of India (1870), and in the Annual Report of 1870-71. They may be divided into (a) canal-watered plantations, (b) plantations grown by rain-fall, with only wells to start nurseries, (c) Sailaba plantations, or those near enough to rivers to have sub-soil percolation.

In the first (a) as many valuable trees—*Shisham, Tún*, &c.—are grown as possible, so as to get, not only a fuel yield, but the highest possible yield both in timber and fuel to compensate for the high cost of cultivation; (b) are principally fuel plantations, giving *Shisham, Mulberry, Kikar, Willow*, &c; in (c) are grown *Shisham* and *Mulberry* with great success. Kikar, in all artificially-watered plantations, is liable to suffer from frost, dying down to the roots, so that the summer following has only to do again the work of the preceding season; but below the Bias, it succeeds admirably, the little plantation at Ludhiana giving a fine example of growth.

(*k.*) The Kachhi forests are tracts of fine and pure *Shisham* growth on alluvial land, and Bilas of the Indus; they have just been demarcated and surveyed, and are in course of transfer. Being actually in the bed of the river, they are liable to erosion and to great change in form; but newly-formed beds can be covered with *Shisham* seedlings by the simplest form of cultivation, and the *Shisham* seems undoubtedly in such Bila lands to be in one of its original homes. The 'Bilas' of the Jhilam give similar excellent results with this tree.

SECTION V.

Description of the Leased Forests.

Chamba.—The *Ravi* forests are chiefly situated on the Ravi and its tributaries, the upper district being on the Ravi, Tuna, and Budhil rivers before they join. Then come those on the main Ravi itself, and then those on two considerable tributaries, the Siul and the Bhandil.

Many of the forests on this river have *Deodar* mixed both with other *pines* and with deciduous trees. Kalatop, near Dalhousie, forms a good example.

The forests grow on an average slope of 25° to 30°. The lowest *Deodar* forest is at 5,000 feet above the sea-level, and the highest between 8,500 and 9,000 feet.

The forests are contained in an extent of 68 miles along the main river, and 87 miles of tributaries, rendering this a scattered and difficult forest division to supervise, and one to which a second officer should be allotted.

The tributaries are—

Kuarsi	7
Surai	5
Budhil	18
Tuna	11
Bel	7
Siul	38
	86

There is an excellent topographical sketch of the forests; with a sketch map, in Dr. Stewart's Chinab and Ravi Report of 1866. These forests yield *Deodar* and *Pinus Excelsa*, with *Chil* only in the lower parts. *Abies Smithiana* and *P. Webbiana* crown the heights, and there are a few *Cupressus Torulosa* in parts (on the Budhil). The *yew* is not rare, but small; there is also a limited quantity of *Quercus Ilex*, the best wood of all our oaks, but too heavy to float, and hence not used. The *Edible pine* occurs only in one locality.

The *Chinab* forests are described also in the second report on this river, which forms part of the volume above quoted.

The *Deodar* forests are mostly pure, but occasionally mixed with *P. Excelsa*, *A. Smithiana* and *P. Webbiana*, but rarely, if ever, with deciduous trees. The leased *Deodar* tract extends along 48 miles of the main river, and 13 miles of tributary streams.

On the upper part of this river, some pencil cedar (*Juniperus Excelsa*) is found. The *Edible* pine hardly exists in Pangi (the province in which these forests are situated). There is a complete absence of *oaks*, but *ash* (*F. Floribunda*) is found in places, giving an excellent timber, and its cultivation might be extended.

The forests are all compactly situated on the right and left banks of the main stream (the *Deodar* preferring the latter), and on the Braknai tributary of the left bank, and the Dún of Sach and Miyah streams on the right bank.

The *Satlaj* forests consist of *Deodar* or *Deodar* mixed with *P. Excelsa*, and very generally the distribution of the species occurs more in belts than on the other rivers, situated on slopes usually from 25° to 45°. The forests are at considerable distances above the river, and there are very noticeable zones of tree-growth covering the hill side. Below, there is occasionally *P. Longifolia*; above that various deciduous trees; and beyond Nachar, a continuous and abundant belt of *Quercus Ilex* (on both banks of the river), with *Pinus Gerardiana* (the edible pine),—which forms considerable forests on the right bank (*e. g.*, near Pangi and Rogi). Above this is the *Deodar* region, and above that *Pinus Excelsa*, where the two are not mixed, *Picea Webbiana* and *Birch* being the uppermost of all.

The only considerable feeder is the Baspa, having forests of *Deodar* on both banks. The Tídang stream on the left bank is the limit of *Deodar*. On the right bank there is the Wanga stream, with one considerable forest of *Deodar*. There are several smaller nullahs running into the main stream, which are mere glens, but, in many cases, containing undeveloped supplies of *cedar*. On the right bank, this is not so much the case, but one very considerable glen that is passed in approaching the curious crag-founded village of Pangi, is a good instance. Many of these forests will only yield their produce after local conversion into scantling.

The Poari forests are included in the above sketch; indeed they do not form any really separate lease; only that having been already granted by a former ruler to the Wuzir Sarjit, it was necessary to take a separate lease of them with that functionary.

SECTION VI.

Position and Composition of Kashmir Forests.

Dr. Stewart reported on these in December 1868, and his report deals chiefly with the *Deodar* supply, and is illustrated by two maps of the eastern and western *Deodar* localities.

The small quantity of *Deodar* in the Uj and Siawa tributaries of the Ravi does not demand much notice: the supply has been mostly worked out.

The eastern portion contains the Chinab below the Chamba boundary for about 120 miles; also its small tributary, the Sansahi, with the larger ones, the Bhutna, the Wardwan, and the Kadran, a tributary of the Wardwan, which all run in on the right bank. The western portion contains the valley of the Jhilum and its great tributary the Kishanganga.

Following these divisions on the Chinab *right bank*, there is first the Sansahi nullah with *Deodar* on both banks, some 2,000 first class trees still remaining after 1,100 trees had been cut, up to 1868. Some *Excelsa* and *Smithiana* are also on the higher slopes. Returning to the main river, there are a few tracts, but of considerable value, of *Deodar* up to Golabgarh, where the Bhutna runs in. On this tributary, for 25 miles on both banks, there are considerable *Deodar* forests, but they had been greatly overworked, 10,000 trees having been felled up to 1867. Mr. Sparling estimated 7,784 first-class trees still on the right bank, and 12,825 on the left. Dr. Stewart considered this estimate excessive.

Returning to the main river down to where the Wardwan joins, there are only a few plots of inconsiderable value, and below that place again (Kishtwar) to the lower limit near Bhagar, the *Deodar* is either in small-extent valleys, or high up on the slopes fronting the main river, and has not been worked for export.

To return to the Wardwan tributary, it runs nearly north and south, with one or two considerable bends, joining the right bank of the Chinab just above Kishtwar. The *Deodar* localities extend over 65 miles of the river going up as far as Inshin. From this place, however, for 20 miles down to where the Kadran joins, the *Deodar* is scattered and few. On the Kadran, there is much *Deodar* on both banks for 12 or 15 miles, the right being more easily workable below the junction. The Wardwan down to Sundar has continuous *Deodar* forests

on the right bank, and a good deal on the left; the right bank is easier to work, and has in some places been heavily indented on even to absolute clearing. Below Sandar, for about six or seven miles, there are further tracts of large forest; those on the right have been worked; those on the left are mixed and at some distance from the river, with difficult ground intervening. Below this point to the junction with the Chinab, are considerable forest localities, but high up.

The *left* bank of the Chinab has many small tracts along it from opposite the Sansahi down to Kishtwar, which, but for the difficult ground, would have yielded largely. *P. Excelsa* and *A. Smithiana* also abound. For 20 miles below Kishtwar, there is nothing but a tract at Darana, some distance from the river; and for 20 miles again (the river having turned west), there are considerable quantities of *Pinus Longifolia*, but no *Deodar* except a large forest at Satrorghur, five or six miles back from the river, and hitherto used only for export of timber to Jummu.

So much for eastern Kashmìr. The western portion is described as follows:—In the eastern portion of the Kashmir valley, there is little *Deodar*, but considerable forest tracts north of Baramulla. From Baramulla to Uri, for 24 miles, there is a considerable and continuous *Deodar* tract on the left bank, with little or nothing on the right; the slopes are easier and the destruction has been great; this is the *Deodar* locality on the Jhilam. The great Kishanganga tributary was examined as far as Naddi, or 50 miles up. *Deodar* in fine and compact forests exists on both banks, but these become more scattered and recede further from the river as the junction with the Jhilam is approached. There is often a large admixture of *P. Excelsa*, and the lower 30 miles of this tributary have forests of *P. Longifolia*. The forests of this fine tributary have been badly treated: felling has often been excessive, and nearly always made in the wrong places.

Dr. Stewart's estimate of first-class cedar trees in Kashmìr is—

5,000	trees for the Ravi tributaries, Siawa and Uj;
35,000	Chinab and Bhutna;
37,000	the Mazzu or Wardwan;
40,000	the Kishanganga.
117,000	

The Kashmìr forests show the usual features; total absence of any preparation of slides or timber roads; felling with high stumps; felling in easy places close to river, without reference to protection of the remaining stock, or shelter for reproduction; wasteful packing of trees, and forest fires. Reproduction is nowhere cared for, but being naturally good in some places, it succeeds of course by chance.

SECTIONS VII AND VIII.

DEMARCATION AND WORKING PLANS.

The leased and State forests above described (excluding, of course, Kashmìr) are grouped into divisions:—

The Hazara and Rawal Pindee forests* form the *Jhilam division.*

The forests in Pangi † (upper Chinab) form the *Upper Chinab division.*

Those on the Ravi and tributaries as far down as the Siul at Manji, form the *Upper Ravi division.*

The remaining forests near Dalhousie and the cantonments at Buklo and Balún, are included with the superintendence of Ravi river in the *Lower Ravi division.*

The Bias (Kullu) and Parbatti forests, together with those in Kangra and Hushiarpur,‡ form the *Bias division.*

The leased forests of Bassahir and the small *Sál* forest of Kalisar, form the *Satlaj division.*

The rakhs, or fuel preserves, of the districts, Lahor, Amritsar, Gujranwalla, Montgomery, Multan, and Muzaffargarh, form the *Central Fuel Reserve division*; those in Gujrat, Jhilam, and Shahpur, and in the Kachhi, form the *Northern Fuel Reserve division.*

Taking the divisions in this order, the work, which this section describes, will be found to be in progress only, but it now receives full, if not paramount attention, and it is expected that ere long the whole of the divisions will be demarcated.

In Jhilam.—The *demarcation* of 64 square miles of forest in Hazara is complete, together with a survey; the rest is in progress and will be complete in about two more seasons.

In Rawal Pindee.—The 1st class or hill rakhs are not demarcated, but arrangements have been made to demarcate, so as to have about 30 per cent. reserved, and about 70 per cent. unreserved forest.

Upper Chinab.—Up to 1870, or five years after the lease, no attempt had been made to demarcate the forests. A new lease has been drawn up and rules promulgated. A survey and

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* Section I, A (*e*, *f*). † Section I, B (*i*). ‡ Section I, A (*a*, *b*, *c*).

demarcation of 60 forests intended to be reserved have been made, 16 more are intended to be taken, and all that remains is to obtain the formal consent of the Chamba State under the rules, when the demarcation pillars will be made permanent.

Upper Ravi.—Also being under the Chamba lease and rules, the same work is in progress, and is now verging towards completion.

Bias.—The Kullu forest (Bias) and those on the Parbutti, are all demarcated with pillars. Those on the Seoraj Kotis are now being visited, and temporarily demarcated with a view to their transfer. This work which is partially done, will be completed next season. In Hushiarpur, special arrangements are made, and two compact tracts free of all forest rights have been demarcated off for the State. A further portion of the Lohara forest still remains to be done, the three other forests, Bindraban, Karanpur (*Bamboo*) and Panjal (*Khas*,) are demarcated, being the property of Government.

The Kangra forests are demarcated in a sort of way with reference to the villages which have rights in them, but no definite arrangement has yet been made for a demarcation, on the principle which is absolutely recognised by Government and everywhere pursued, *viz.*, the selection of a part of the forest for strict conservancy, with the abandonment of the rest for the exercise of forest rights. The subject in Kangra is fraught with difficulty arising from the complications caused by the first settlement.

Satlaj.—The whole of the forests are demarcated. It may be found advisable at some future time to make the Bassahir demarcations more permanent; at present, however, the forest limits seem well understood, as denoted by heaps of stones and blaze marks with initials, or boundary trees.

Fuel Reserve Divisions.—The whole of the "rakhs" or fuel reserves are nominally demarcated, but in some cases it is only done with "kutcha" or mud pillars, which are easily moved. Some districts are beautifully demarcated with white masonry pillars, which can be seen from a distance. Such is Jhilam. All that seems needed, is a gradual restoration of boundary pillars, and substitution of masonry for kutcha.

Plantations.—Area of course fully demarcated.—The area demarcated, or about to be demarcated, is approximately that given in section I.

Working Plans.—A regular working plan for the Kalatop forest has been prepared and also for the Vahn Khara Circle of the great Changa Manga plantation. A sketch for the guidance of any one who should be called on to prepare a working plan of the Upper Bias forests, is also in existence, and a brief sketch for 16 years' working of the Satlaj forests (Bassahir). The organization of a staff of officers, who could be constantly employed on this work, is a *desideratum*.

SECTION IX.

Plantations.

At first starting, the difficulty of obtaining land, and the necessity of making experiments, caused the commencement of work on a number of detached blocks. The effort of the last few years has been to consolidate the work in larger and more compact areas, and the work to be done was to obtain three large centres of plantation,—one for the line from Multan to Amritsar, one for that from Amritsar to Dehli, and one for the Northern Railway. For the projected Indus Valley lines, the natural fuel resources of the country would appear to be sufficient. The following small plantations have been given up:—

Sonakí.
Mulvahn.
Sarangwal.

Some plantations have been partly completed and are returned to the fuel reserve divisions or to other divisions, as decided to be not worth any further expenditure. Most of these, however, are fairly stocked.

Rodshah and Tera are the two worst; the results are indifferent, and in some parts the trees died away. An effort has been made to treat them with a rough and inexpensive mode of dibbling in mixed seed of Jhand and fuel trees, and after watering letting them take their chance.

The plantations so completed are—

Serai Amanat Khan,
Rodshah,
Tira,
Ravi and Montgomery,
Naushera (returned to the Bias Division as too far off) to be otherwise supervised,

A table of the expenditure on these plots, is appended. A great deal of it is of necessity a preliminary expenditure on experiments, for until by such knowledge data for the selection and treatment of land was obtained, it could not be expected that all expenditure should have an equivalent return. It is only, however, in the plantations Tira, Rodshah and Serai Amanat Khan, perhaps, that a loss need be anticipated.

Abstract of Expenditure on each Plantation up to end of March 1871.

Name of Plantation.	Area of each Plantation.	Up to 1st of April 1870.			Up to 31st March 1871.			Total.		
	Acres.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Nâg	500	16,531	2	7	3,307	5	10	19,838	8	5
* Serai Amanat Khan	300	16,836	14	5	1,839	13	8	18,676	12	1
Naushera	658	10,395	2	0	1,602	3	4	11,997	5	4
* Sonaki	200	1,301	11	9	.....			1,301	11	9
Jallandar	46	2,037	2	6	834	7	11	2,871	10	5
Philor	235	9,726	0	11	1,486	1	8	11,212	2	7
Ludhiana	200	3,463	5	0	1,016	10	4	4,479	15	4
Jugadri	200	6,568	10	7	138	11	0	6,707	5	7
Tilauri	477	6,334	1	7	808	6	3	7,142	7	10
Tira	660	26,036	14	4	7,639	8	3	33,676	6	7
Rodshah	270	14,077	3	9	4,852	13	1	18,930	0	10
Jugian and Shadera	900	5,219	14	4	1,111	1	2	6,330	15	6
Changa Manga (Vahn Khára Circle)	5,668	41,704	13	0	52,066	14	1	93,771	11	1
Khanwa	420	7,759	3	0	1,817	10	3	9,576	13	3
Pani	600	10,411	1	9	1,732	8	3	12,143	10	0
* Baoli Lehna Sing	100	83	8	6	2,121	1	7	2,204	10	1
Dehli	800	.....			1,974	0	0	1,974	0	0
* Sarangwâl	40	1,209	3	1	12	11	0	1,221	14	1
* Malvahn	40	118	8	0	.....			118	8	0

Remarks.

	Rs.	A.	P.
Outstanding on 1st April 1870	18,290	5	0
" " 1871	3,408	2	0
Balance ...	14,882	3	0
Outstanding on 1st April 1870	711	0	0
" " 1871	778	12	3

Those marked * were abandoned. On most of them there is some growth as Sopakí and Malvahn., but they were given up, because there was no need of any outlying plots, when the great Changa Manga forest proved a success. Baoli Lehna Sing proved a failure, owing to water difficulties.

The plantations are either (1) canal watered, (2) irrigated by rain-fall, or (3) "Sailaba" or by sub-soil river percolation. The former have usually rich soil, and results are certain, provided there is sufficient water-supply and good sub-soil drainage. The second are generally successful, if tried in districts where the rain-fall is over 20" per annum, but wells are required to start nurseries, &c. The third are the cheapest and easiest of all, but the liability of the land to erosion constitutes a serious drawback.

The rule is always to grow the best trees possible, on the coppice with reserved standard system, leaving it to the poorer soils to be supplied only with fuel trees such as grow in the 'reserves' naturally.

Sissú (*Dalbergia Sissú*) Kikar (*A. Arabica*) Tún (*Cedrelatoona*) are the trees mostly grown, but bér, jhand, (*acacia lencophlœa*) *A. Serissa*, are also grown; the *eucalyptus* has been tried, but while it succeeds tolerably, it is clear that the lower hills and not the plain plantations are its real place. *Willow* is used in moist places, and *tamarisk, Jhand, phulahí*, &c., in indifferent soil; canal and rain-fall plantations are treated by making a water trench, and sowing on the ridge formed by the earth turned out; transplants from nurseries are also very largely adopted. In Sailaba plantations when the flood subsides, and the soil is soft and moist, mere plough lines are run through and sown.

The failures have been already alluded to. Changa Manga, Ludhiana, Jagian and Shadira, Nâg, Jallandar, Philor and Khanwâ are all successes in something like the order in which they are put down.

SECTION X.

Conservancy and Working of protective Establishments.

The conservancy of forests depends on the law of the country and the rights which encumber the forest. All Panjab forests are either leased from foreign states or belong to Government. The former are provided for by the terms of the lease. In no native state is it admitted that the people have any *forest rights*, but the leases usually stipulate that the people should have free wood for building, and free firewood, as privileges, &c. In many places, as in Pangi and on the Satlaj, the population is scanty, and the demand does not press heavily. Grazing is the greatest trouble, and especially the vast herds and flocks which the *gaddies*, or roaming shepherds, periodically bring. On the Satlaj there is complete protection, cattle are allowed only into such forests as the Forest Officer declares not liable to injury, and wood is granted from unreserved forests by permit.

In Chamba the population is denser, and there the forests have been provided by selecting a portion for strict conservancy, and a code of forest rules are appended to the lease.

In British forests, numerous rights as quasi-rights were created at the old settlement, or allowed to grow up since. In Kangra and Kullu the forests are worst off in this respect, as not only are their grazing rights even in the reserved forests, but also rights of collecting the dead leaves for manure, a peculiarly dangerous custom. The right of Government however to prohibit these practices in plots where reproduction or planting is going on, is practically enforced, but needs the utmost circumspection and discretion in the Forest Officer in charge. In the Hazara and Rawal Pindee forests, as well as those of Gurdaspur, the reserved forests are mostly free of rights, by the system of exchange.

Offences in Kullu are punished under the rules of 1859, which appear to have the force of law. Those in other districts, for which special rules are not made, are punished under the Indian Penal Code, as mischief, trespass, &c. The fuel reserves of the plains belong to Government free of rights, with the exception of those in the Jhilam district, which were differently treated at the settlement, and the deplorable condition of which is now the subject of anxious endeavours for a remedy. The only way conservancy is effectually kept is by constant European supervision. We at present have no class of native subordinates able to take actual charge of a forest tract. Among the lower order of officials, occasional changes are needed, for it is found that they have fallen too much into the good graces of their neighbours.

The low rate of pay of watchers is a source of uneasiness. The rate of Rs. 5 is still fixed for the great majority, and this is a salary on which it is impossible to live honestly, especially in the hill districts.

This fact has at length been recognised in the police force, and should be in the forest staff.

The present strength of the protective establishment is divided into three classes:—Forest Rangers, Foresters and Forest Watchers; these are supervised by the controlling staff of 5 Deputies, 12 Assistants, and 4 Sub-Assistant Conservators.

There are Forest Rangers from 200 to 100	...	4
Ditto Foresters from 50 to 15 ..	...	34
Ditto Forest Watchers from 10 to 5	...	5184

Of these 15 foresters and 75 watchers are occupied in the supervision of the floating of timber, and the guarding of the rivers and depôts; so that for a total area of actual forest of 3,570

square miles, which does not include the tracts of country which the foresters and others have to move about over, there is approximately as follows :—

1	Assistant, Sub-Assistant or Ranger to ...	223	square miles.
1	Forester	75	ditto
1	Forest watcher	6	ditto

The present cost of the establishments is as follows :—

Direction and controlling per annum (at average salaries)	Rs.	1,37,000
Protective establishment	„	61,236

Communications and Works.

Treated by Divisions, the principal works may be now named :—

Satlaj.—A bridle path has been constructed along the right bank below Wangtu, from which place the Hindustan and Thibet Road crosses to the right bank. From that point on the opposite bank, an excellent mule road up to Kilba was constructed by Messrs. Brassey, Wythes and Co. during the working out of their 8000 tree grant; beyond that a foot-path is being carried on along the forest base. A path has also been made up the Wanga tributary. An excellent timber bridge built on the "Sanga" principle, crosses the Satlaj at Shultu. This cost rather less than Rs. 3,000.

Two other similar bridges—one at Rampur and another beyond Shultu—are contemplated. Forest houses at Nachar on the Satlaj, and also in the Kalisar forest have been built.

Bias.—The valley is well traversed by roads; the Forest Department have not therefore had much need to extend them. There is a forest house and office built at Dugri, also a small one at Jelu in Seoraj, and others are in the course of construction; rest-houses also have been put up at Pandan in Hushiarpur, and at the river depôts.

Ravi.—A good forest house has been erected, and a road made passable for ponies from Chamba to Barmur, and from thence to Lamu.

Chenab.—Besides a large forest house and granary, a road has been constructed from Kilar to Chamba on the Sach Pass. Below Kilar, after descending to the level of the precipice above the river by an excellent road, the river is crossed by a rope suspension bridge made by Mr. E. Sparling, Assistant Conservator, on the principle of a jhoola, but so improved with a plank foot-way, side-netting and side-stays to steady it, that a pony can easily cross. The foot-way is taken up during winter to avoid the pressure of accumulated snow. The road continues till the mouth of the stream is reached, which flows down from the Sach Pass (joining the Chinab on the left bank); up this the road turns. It crosses the stream below the Chanchal Pari Forest over a high level wooden bridge, the approach to which was made by a skilful piece of blasting work; the broad path continues to the pass and beyond to Tisa. The road down from Tisa to Chamba is also laid out under orders in this department, but is not well done.

Beyond Kilar on the upper valley, the road is continued for some distance up the right bank, and then the main road crosses to the left; a timber bridge is now being constructed to replace a dangerous native jhoola.

Jhilam.—The forests have been so recently transferred that no works have as yet been made. A good forest house is in course of erection at Jhilam.

Timber Depôts, and their management.

The sale of timber has been provided for by a complete set of rules issued in 1870. The floating of timber, and control of river operations, is regulated by a set of rules issued under Act VII of 1865.

Depôts are classified into *Transit* and *Sale*. The former are stations at which timber is caught, examined, passed, and transmitted in rafts to the sale depôts. The latter are stations authorised by Government on the main rivers. They are as follows :—

Satlaj—Philor.
Bias—Wuzir Bhular and Nadaon.
Ravi—Madhopur. Shadra (Lahor).
Chinab—Near Wuzirabad, also Multan.
Jhilam—Dulyal, Jhilam Cantonment.

Permanent or sale depôts are demarcated, and the timber arranged in lines, according to quality and to length as well as sort of timber. We have 1st class, or serviceable, 2nd class or unserviceable, both of *pines* and *cedar*, fancy woods (*walnut, yew,* &c., &c.), and firewood or scraps.

Sales are mostly for cash only, under conditions of deposit and marking, &c., which may be seen in detail in the rules. The legal position of buyers who have paid the deposit, and are gradually removing the stock, is exactly defined, so that no dispute can arise.

The State railways have at present a prior claim, or right of first refusal of timber, for which purpose monthly notice of timber arrivals are sent to the local officers.

First class *deodar* is sold at rates fixed by the Conservator with the sanction of Government
First class *P. excelsa* at ⅔ these rates.
First, class *P. longifolia* a ½ ditto.
A. Smithiana and *P. Webbiana* at ¼ ditto (or by special contract whichever pays best).

Unserviceable timber of all classes is sold by special contract, or auction at the discretion of the depôt officer.

"Fancy woods" as yet come down in limited quantities, and are usually sawn up so as to show off the grain and quality, and sold in that state by special contract.

Forest Offences.—It is not possible to give a table of such offences, as the criminal returns of the courts do not provide for any such heading. Forest fires in the lower hill tracts are the most destructive offence, but in the Rawal Pindee district, where they are most frequent, they have recently been much reduced by the vigorous action of the local magistracy.

Timber thefts on the river, cutting off and changing marks, are also common offences on the rivers, and are generally very inadequately punished. The fact that some of the rivers run through Native territory, and that the said States have very irregular methods of selling their timber, render the detection of offences difficult, as there is the excuse ready to hand that the suspicious timber was obtained in foreign territory.

Waif rights at one time gave great trouble, but recent Government orders have declared *in effect* that nothing is waif which can by *any means*—whether by the felling or sawing marks, class of timber, &c.—be identified as belonging to Government or an individual owner. Waif taken by Native States is now collected for inspection so as to prevent fraud.

Wherever forests are demarcated and tracts left open for exercise of rights by villagers, trespasses and offences injurious to the demarcated tracts are comparatively rare. Cattle trespass, however, is common in the rakhs, or fuel reserves, and especially in the plantations where a good feed of the fine grass produced, amply compensates for the small ground-fee levied. It is a most unfortunate mistake that the Trespass Act (I of 1871) *fixes* the fees, so that there is no scope left for local authority to fix a preventive scale according to circumstances. We have often to resort to civil action for damages to suppress the ingress of cattle. "Kils" and irregular cultivation clearings are quite unknown in the Panjab.

Forests under District Management.—The only lands that will remain under district management will be the forest, or rather fuel tracts, in the trans-Indus territories, which, on various grounds, it is not desirable to sever from district control at present. In the following districts, there will remain an area of unreserved fuel tracts, for some of which (as Montgomery) there will be some income from wood, but the principal revenue will be from grass, and the establishment maintained should be charged against this main head of income :—

* Montgomery ... ... * Multan ... ... * Muzafferghar ... ... Jhilam ... ... * Shahpur ... ... * Rawal Pindee ... ... * Jhang	Not at present known as distinct from Forest Department revenue, as the transfers are not completed at close of 1870.

	Grazing.	Wood.
Peshawar Division	2,684	5,069
* Derajat "	7,885	12,932
Dehli "	2,747	
Hissar "	5,546	
Amballa "	260	
Districts of Sialkot Division	578	

The districts marked thus (*) are managed by the "Tirni" system, or partly by "Tirni" and partly by lease.

"Tirni" is the levy of a tax per head of cattle, after paying which they are free to roam in the whole district.

By the lease system, which prevails elsewhere, certain tracts or rakhs are sold by auction, the contractor pays the price by instalments, and thus purchases the right to collect grazing dues within the tract. In Montgomery a sort of modified Tirni, called the "Chak" system obtains. The district is parcelled out into a number of tracts or "chaks," and villages are all assessed with certain grazing dues, on payment of which they are entitled to graze *in* their "Chaks," and not beyond, without paying special fees. All such dues are recovered by revenue process (*vide* section 64 of the Panjab Land Revenue Act).

It is of no importance to record the results of the Kangra and Hazara forests still under district management, as they are being rapidly transferred to the Forest Department. The wood is at present sold to, and cut by permit-holders, who pay in advance and engage to remove their material within a certain time, failing which it lapses. Lists of local rates are published.

Working of Government Forests.—The principal yield is from (*a*) timber (*b*) bamboos and minor produce, (*c*) fuel, (*d*) grass.

(*a*). Timber is worked on all the rivers by Government only, and put into the river by direct Government agency; in a very few cases standing trees are sold by permit, the holders felling and removing the material themselves: such permits are paid for in advance. The Government timber, when felled, is transported to the plains, and sold at depôts as already described. Should debts arise, which is now hardly likely, they could only be recovered in the civil courts.

(*b*). Bamboos are sold at fixed depôts, and at fixed rates per hundred for cash payment; minor produce is usually a very small item, and is often included in the grazing leases.

(*c*). The income from fuel is derived from the "fuel reserves," and has of late years been augmented by the large supplies required for the Sindh, Panjab, and Dehli, and the Northern State Railways, and for the large cantonment at Rawalpindee, &c.

(*d*.) Grass is a very large item of revenue. It is either collected by Tirni as in the district grazing ground (*vide* ante para.), or by sales of leases for the right of grazing. In the former case, it is managed by the Revenue Officers, and the share of the whole district income appropriated to the forest area is credited to "Forests."

The annexed statement shows the income of the first five years, under each head, ~~also~~ expenditure *per contra*.

Private forests and sacred groves.

There are no private forests of any extent, if we exclude the tracts of Shamlat or common land attached to villages for their own use. A very few jagirdars have areas of forests, and in Kangra there are good tracts of bamboo and *pinus longifolia* belonging to the Rajah of Dada Siba.

Sacred groves are everywhere demarcated; they exist nowhere but in the hills where clumps of *Deodar* around temples and shrines are preserved.

In the plains, small groves of trees, such as "pipul" may be seen near tombs and faqeer's places, but such are excluded from forest area, and are always respected as private property under charge of the resident religious guardian.

Introduction of Trees.

A paper on this subject will be found in the Report of the Forest Conference, 1871-72. *Fruit* trees have been introduced with success chiefly in the hills and by private parties; the best were *apples, plums, apricots, peaches,* and even *gooseberries* and *currants.*

In the plains *Seville oranges* have been successfully cultivated at Gujranwalla, and *grapes* in several places. Attempts have been made to introduce the *Spanish chesnut,* but on a very small scale. Experiments with *Larch* and the *Cork oak* have hitherto proved failures.

Of Australian trees the beef-wood *(Casuarina)* is an established tree in the plains, also some species of *Eucalyptus,* but the latter thrives best in the lower hills, and in sub-montane valleys like Abbottabad.

The *Tallow-tree* of China is also a successful introduction both in the lower hills and in the plains.

The frost proves too severe for *teak;* and *sál,* except in places near the Jumná, does not grow, and even then, not to any size.

This account of the Panjab forests may be conveniently closed with a statement showing financial results for the past five years, with an explanatory note appended.

The forest divisions are shown separately from the fuel reserve and plantation divisions.

STATEMENT No. 1.

Abstract of Results of Forest Operations in the Panjab, for the five years ending 31st March 1871.

			1866-67.	1867-68.	1868-69.	1869-70.	1870-71.	Total for 5 years.
WORKS AND RESULTS.								
FORESTS—								
Remaining from previous year		Logs	13,358	6,778	4,852	7,687	19,894	...
Felled in the year	Deodar	Trees	5,060	1,569	955	7,916	3,194	18,694
	Excelsa	"	...	270	100	...	1,171	1,541
Trimmed and marked	Deodar	Logs.	25,844	5,674	6,301	33,032	13,243	84,094
	Excelsa	"	...	1,049	259	...	4,621	5,929
Launched	Deodar	"	34,424	15,074	19,227	22,775	29,157	1,20,657
	Excelsa	"	...	940	259	...	3,760	4,959
Remaining unlaunched	Deodar	"	6,778	4,743	7,391	19,894	3,980	...
	Excelsa	"	...	100	246	...	861	...
Windfall launched		"	24,046	6,778	2,980	24,092	25,875	83,771
DEPÔT—								
Remained from previous year ...	Timber	Logs	6,110	15,513	4,230	4,402	17,136	...
	Total contents ...	C. F.	91,933	2,15,676	3,43,810	65,273	2,57,504	...
	Sleepers	No.	10,693	3,530	3,476	1,592	1,024	...
	Beams	"	...	480	180	781	...	...
	Inferior Pines ...	C. F.	1,61,924	1,02,439	85,750	23,700	50,019	...
Brought into depôt in the year ...	Timber	Logs	50,872	29,375	16,366	24,357	43,861	1,64,831
	Total contents ...	C. F.	5,93,882	4,94,359	3,06,848	4,70,806	9,72,072	28,37,967
	Inferior Pines ...	"	87,316	21,059	28,317	30,118	2,39,832	4,15,642
Sold in the year...	For Railway ...	"	81,359	16,009	3,93,722	25,924	34,470	8,31,484
	For public use & private dealers	"	4,54,476	5,51,598	36,664	2,52,651	55,297	13,50,681
	Total Deodar ...	"	5,35,835	5,67,602	4,30,386	2,78,575	3,69,767	21,82,165
	Inferior Pines sold ...	"	17,120	23,794	18,555	12,799	32,103	1,04,371
Remaining in depôt	Timber	Logs	15,481	5,998	4,402	17,136	37,854	...
	Total contents ...	C. F.	2,14 021	1,07,154	65,273	2,57,504	7,71,869	...
	Sleepers	No.	12,567	3,476	1,592	1,024	12	...
	Beams	"	2,232	180	781	...	...	...
	Inferior Pines ...	C. F.	1,02, 439	79,661	23,700	50,019	1,45,390	...
FINANCIAL RESULTS.								
INCOME.—								
Amount by sales during the year			2,21,610	2,57,850	3,02,753	2,87,007	6,87,495	17,56,715
Estimated value remaining in Depôt at end of the year			77,186	75,622	39,359	2,10,593	6,07,342	...
Estimated value of receipts in Depôt during the year			2,87,567	2,42,000	1,50,581	3,40,323	9,32,376	19,53,853
Total Expenditure			2,37,866	2,16,949	1,48,593	5,38,007	9,64,281	21,05,696
Difference of expenditure from amount of sales			1,04,233	38,751	10,739	1,31,551	3,48,981	...
Ditto ditto from value received into depôt			1,39,427	39,121	40,512	44,262	1,00,048	1,51,343
Outstandings by contractors			1,55,771	2,12,582	1,35,618	1,29,768	28,565	...
Ditto on sales			2,12,582	1,35,618	1,29,768	1,65,175	38,943	...

WILLIAM L. ALLEN,

In charge Forest Office of Accounts,
Panjab.

STATEMENT No. 2.

Abstract of Results of Operations of the Fuel Reserve, and Plantation Divisions in the Panjab Forest Department, for the five years ending 31st March 1871.

	1866-67.	1867-68.	1868-69.	1869-70	1870-71.	TOTAL.	REMARKS.
INCOME.							
Fuel Reserve	.....	....	... .	73,444	3,31,046	4,04,490	
Plantation	9,860	21,446	42,408	33,681	21,827	1,29,222	
EXPENDITURE.							
Fuel Reserve	... .	.	... ..	82,696	1,57,093	2,39,789	
Plantation	17,764	56,926	1,60,752	92,951	1,12,582	4,40,975	
STOCK ON HAND ON 31ST MARCH 1871.							
Fuel Reserve	.....	...	... .	46,676	1,10,127	1,56,801	
Plantation	.. ..	.....	.....	5,000	5,500	10,500	
OUTSTANDINGS ON 31ST MARCH 1871.							
Fuel Reserve	. .	.....	.....	... ..	26,081	26,081	
Plantation	.....	.	.....	.....	3,319	3,319	
DUE BY CONTRACTORS.							
Fuel Reserve	.. .	. .		60,005	1,02,217	.....	
Plantation	... .	.....	...	19,808	5,785	. ....	

W. L. ALLEN,
In charge Forest Office of Accounts,
Panjab

STATEMENT No. 3.

Expenditure by the Panjab Forest Department for the five years ending March 1871.

	Expenditure.					Total.	Remarks.
	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.		
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
A. Conservancy and Working ...	1,76,950	1,75,920	1,93,513	5,55,375	10,30,005	21,31,763	
B. 1 and 2, salaries and travelling allowances	74,540	92,0 9	1,09,073	1,45,787	1,93,689	6,15,198	
Contingencies	4,140	5,846	6,759	12,492	10,262	39,499	
Total ...	2,55,630	2,73,875	3,09,345	7,13,654	12,33,956	27,86,460	

W. L. Allen,
In charge Forest Office.

STATEMENT No. 4.

Receipts of the Panjab Forest Department for the five years ending March 1871.

	Receipts.					Total.	Remarks.
	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.		
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
I.—Sale of Timber at Depôts ...	2,08,920	2,30,785	2,86,991	1,32,794	6,92,864	15,52,354	
II.—Sale of Timber removed by purchasers	11,910	11,141	14,645	15,202	1,78,853	2,31,751	
III.—Duty on Foreign Timber ...	.....	.....	.....	20	70	90	
IV.—Permit Fees	.....	127	5	54	100	286	
V.—Grazing dues	9,500	266	4,747	20,400	1,28,701	1,63,614	
VI.—Sale of Fruit, &c. ...	.....	19,235	17,537	2,18,718	293	2,55,783	
VII.—Sale of confiscated Timber ...	1,060	6,995	18,000	3,585	48	29,688	
VIII.—Fines and Forfeitures ...	80	967	860	1,787	3,741	7,435	
IX.—Miscellaneous	.....	9,780	2,376	1,572	35,698	49,426	
Total ...	2,31,470	2,79,296	3,45,161	3,94,132	10,40,368	22,90,427	

W. L. Allen,
In charge Forest Office.

General Working of the five years.

In all 18,694 *deodar* and 1,541 *excelsa* trees were felled; 84,094 logs of *deodar* and 5,929 of *excelsa* were trimmed and marked; 1,20,657 logs of *deodar* and 4,959 logs of *excelsa* were launched, besides 83,771 of windfall.

Depôt.—Our total receipts in depôt were 1,64,831 logs, containing 28,37,967 cubic feet of *deodar* and 4,15,642 cubic feet *inferior pines.*

The sales during the five years were 21,82,165 cubic feet *deodar,* and 1,04,371 cubic feet of *inferior pines.*

Financial results of the five years :—

	Rs.
Total Expenditure	21,05.696
Total Revenue	17,56,715
Excess in Expenditure	3,48,981
Against this amount we have timber remaining in depôt, estimated at ...	6,07,342
Outstandings	38,943
Dead Stock and Buildings	16,000
Outstandings due by Contractors	28,565
	6,90,850

but to be on the safe side, I would say 25 per cent. of this amount should be allowed for wear and tear and possible bad debts; we should then stand—

Value of Stock in hand	6,90,850
Less 25 per cent.	1,72,712
	5,18,138
Deduct excess in Expenditure...	3,48,981
Balance in favor of Forests	1,69,157

In the above, I have given the working of the forests only. Statement No. 2 gives that of fuel reserve and plantations; the former in 1869-70 has Rs. 73,444 revenue against Rs. 82,696 expenditure, but in 1870-71 has an income of Rs. 3,31,046 against a cost of Rs. 1,57,093, giving a profit of Rs. 1,73,953.

Plantations give a very different result. A large sum of money has been sunk with, for the present, but a small return. Against a total expenditure of Rs. 4,40,975, we have only an income of Rs. 1,29,222.

We may take the working of the whole Province as standing thus :—

		Rs.
Total expenditure on Fuel Reserve		2,39,789
Ditto Plantations		4,40,975
		6,80,764
Revenue from Fuel Reserve	4,04,490	
Ditto Plantations	1,29,222	5,33,712
Excess in Expenditure...		1,47,052

Against this we have as follows :—

Value of Stock in Fuel Reserve, estimated at Rs. 1,10,127 less 25 per cent. ...	82,595
Ditto Ditto Plantations " " 5,500 " " ...	4,125
Dead Stock and Buildings " " 5,000 " " ...	3,750
Outstandings in Fuel Reserve " " 26,081 " " ...	19,561
Ditto Plantations " " 3,319 " " ...	2,490
Due by Contractors in Fuel Reserve " " 1,02,217 " " ...	76,663
Ditto Ditto Plantations " " 5,785 " " ...	4,339
	1,93,523
Deduct excess in Expenditure	1,47,052
Balance in favor	46,471
Add Balance in favor of Forests	1,69,157
Balance in favour of Province	2,15,628

with Rs. 4,40,975 sunk in plantations, which shews the forests themselves, and the rakhs have given a profit of over a lakh of rupees yearly.

WILLIAM L. ALLEN,

Assistant Conservator in charge of Forest Office.

APPENDIX B.

REPORT ON SAL FORESTS OF KAMAON AND GARHWAL, IN THE N. W. PROVINCES.

Memorandum from—Colonel C. J. HODGSON, R. E., Secretary to the Government of the North-Western Provinces, in the Public Works Department, to the Conservator of Forests, North-Western Provinces,—(No. 79F, dated 17th March 1869).

Conveys the best thanks of His Honor the Lieutenant-Governor for the clear and comprehensive report now submitted on the forests in the outskirts of the Himalayas in the Kamaon Division, and observes that the view of the Conservator, as to their general condition and the vast treasury of valuable timber, existing and prospective contained in them, are considered highly gratifying.

2. The proposals submitted by the Conservator in respect of the future management of these forests, have the concurrence of the Lieutenant-Governor in every respect. The objects to be kept in view are,—the closing absolutely of all forests which, from previous treatment, need time to recover themselves; the division of the virgin or other forests that can be worked into blocks which may successively be taken up as sources of current supply; and the thinning out of all over-stocked forests.

3. For the second and third objects, and, indeed, for effective administrative control, it is absolutely necessary that the construction of path-ways and roads be diligently prosecuted, and if there is any point which may not have been sufficiently dwelt upon by Major Pearson, it is perhaps this. His Honor the Lieutenant-Governor would be glad to have a scheme as to the best means of carrying this out, and the Government of India, will be requested to consider the desirability of devoting the current Forest income to carrying out these essential works and providing sufficient establishments for this purpose.

4. The Lieutenant-Governor notices with regret that portions of the forest have been so cleared of timber, and so over-grown with grass and scrub, as to prevent the rise of forest trees; and His Honor will be glad to find that the plan of keeping the grass from fires in the expectation that it will die out, may prove successful. There is, however, some ground for apprehending that these tracts will continue in their present state, and if so, it might be worth considering whether they should not be cleared for cultivation; but this should not be done so long as there is any prospect of their becoming again productive as forests.

5. Major Pearson's expression of his appreciation of the labours of the Commissioner, his predecessor in the charge of these forests, is noticed with much satisfaction by His Honor the Lieutenant-Governor. It is in every way pleasing to find so high a testimony borne to the forest administration of Colonel Ramsay, and its excellent results. His testimony to the services of Colonel Ramsay's staff, especially Colonel Baugh and Mr. R. Thompson, has also been noted.

6. In conclusion, states that His Honor the Lieutenant-Governor is much pleased at the energy and intelligence with which Major Pearson has opened his administration of the forests in these Provinces.

Endorsement by the Government of the North-Western Provinces, in the Public Works Department,—(No. 80F).

Ordered that a copy of Major Pearson's Report, with a copy of the foregoing, be forwarded to the Secretary to the Government of India, Public Works Department, for information.

From—Major G. F. PEARSON, Conservator of Forests, North-Western Provinces, to the Secretary to the Government of the North-Western Provinces, in the Public Works Department,—(No. 102A, dated 31st January 1869).

These forests extend from the Ganges on the west, to the Sarda on the east, covering the lower spurs and ridges of the Himalayas. They are bounded on the south by an excellent cart-road which has been constructed from the Ganges as far as Karnsot in Kamaon. From thence the Phika River marks the boundary for about 3 miles, and from that point an irregular line marked by roads and pillars carries it on as far as the Sarda. The Ramganga, and its tributary, the Barsoti, are the boundary between the two grand divisions of Kamaon and Garhwal, while the Himalaya Mountains in the rear of both shut them in like a wall towards the north. Except the Kamaon Iron Company's grant, which is clearly marked off by pillars, and a very few villages, which do not affect the actual forests in any way, and for the removal of which it has not been thought worth while in consequence to make arrangements, the whole tract forms a great State forest in one compact block, perfectly defined by natural

and easily recognised boundaries. Within these limits no private rights exist which can prove injurious in any way to the forests, and cattle-grazing is entirely prohibited, except in a few places where the cattle can do no harm whatever. The taking up of fresh land for cultivation has been entirely stopped above the main road, and, I believe, I may say that there is no State forest in India to be compared to this one for extent, compactness, and perfect control.

2. The principal timber tree is *sâl*, which grows with vigour everywhere, and covers by far the greater portions of the forests. *Tún* and *shisam* are also plentiful in certain localities, especially along the low flats and moist valleys, and they grow exceedingly well, and attain a large size; while other jungle trees, especially the *pentapteras*, *conocarpus*, and the *naucleas* (*sein*, *bakla*, and *huldu* or *kiem*) are found mixed with the *sâl* everywhere even where the latter predominates.

CHAPTER I.

The Garhwal Forests.

3. The Garhwal Forests resolve themselves into four main divisions, commencing from the westward—

I.—The forests of Chandi.
II.—The forests of Udaipur.
III.—The forests of the Kotri Dún.
IV.—The forests of the Patli Dún.

I.—The Chandi Forests.

4. The Chandi Forests extend over an area of from 120 to 130 square miles, stretching from the Ganges to the Riwasam River—a distance in a direct line of about 12 miles. The geological structure here is mainly sandstone and drift boulders.

5. These forests may be said to have been completely worked out, as their proximity to the Ganges has rendered them easily accessible to the contractors and agents of the Roorkee workshops and Public Works Department. But *sâl* saplings and unsound trees are found scattered over a large portion of the tract, and in some places the former show considerable promise, though at present the young *sâl* has not generally made as much head as could be wished with other trees which occupy a large portion of the ground; and it is a matter of consideration whether hereafter the growth of the *sâl* may not be favored by the removal from the more promising portions of the forest of other descriptions of timber. This, it is hoped, may be effected through the demands of the Railway for fuel, which could conveniently be floated down the Ganges to the line. Only a few mature *sâl* trees now remain, and these are confined to the higher and more inaccessible ridges on the north and east sides of the division.

6. At present, dry wood for fuel, and bamboos, which are floated down the Ganges, are the principal articles of export from these forests.

II.—The Forests of Udaipur.

7. This division extends from the Rewassum on the west, to the Ko River on the east—a distance of about 16 miles. The soil is a dry sandy loam, with outcrops of gravel and blue clayey shale in the hills.

8. This division contains evidences of having formerly been highly populated and well cultivated, but there is a great want of water through all the lower portion of the forests. Only three tracts of *sâl* are found here. The first extends along the Riwasam, containing some mature trees, but was considerably worked by Captain Read, and now but little valuable timber remains in it. The second, along the Chaukighata stream, contains also some mature trees as well as *tún* in the low moist valleys: and the third is a young *sâl* forest in the south-east corner of the division, and is about three square miles in extent. For the rest, bamboos grow extensively all over this division and form a main article of export. The *terminalias pentapteras*, and *nauclea* (*bahira*, *sein*, and *huldú*) are also found on the lower plains along the southern boundary.

III.—Forests of the Kotri Dún.

9. The Kotri Dún is, in fact, the valley of the Sunahi River and its affluents. The Ko River forms its western boundary, and the ridges of the Patli Dún its eastern one. The formation of the soil is sand-stone and drift.

10. The whole of the Kotri Dún may be called a nearly pure *sâl* forest, differing in value in different places, according to the character and quality of the soil, and other natural circumstances.

11. In area the Kotri Dún is about 200 square miles; within its limits there are few forests which have never been worked; and where this has been the case, it will not be possible to remove any more trees until time has been given for the second class trees to come to maturity; but there are still some forests (as those of Suwursot and Giril Pani, Gangun Kumairi, Loharkoti, and Silani), which from being more inaccessible have escaped felling operations, and these still contain a considerable amount of fine timber. On the whole, the

soil is perhaps not very favourable to the growth of really fine timber, and this fact, coupled with the effect of the forest and forest fires, has rendered the young trees less clean in their bark, and more knotty and inferior in their heads, to those in more favoured localities. However, the second and third class trees are by no means of indifferent character, and the saplings show much promise. Since these forests have been rigidly protected, they have evidently made much progress, and the keeping out of fires and cattle will in a few years do much more for them.

12. There is a large trade in timber and minor forest produce from the Kotri Dún to Najibabad, from which the Mirat and Bijnaur Districts are supplied with these products. The former is furnished partly from the old logs lying in the forest, which the traders are allowed to cut up and carry away on paying a royalty, and partly by regular felling operations—the timber being collected to Depôt at Sunahi and disposed of there.

IV.—The Patli Dún Forests.

13. The Patli Dún comprises the valley of the Ramganga and of its affluents, and the ridges which run between their water-sheds. In area it is about 280 square miles, of which 200 are nearly pure *sâl* forests. Its geological formation is composed of alluvial deposits and drift in the valleys and plateaus, and massive grey sandstone interspersed with blue shale on the ridges. The whole Dún has been a noble forest of *sâl*, the lower and more accessible portions of which have been worked out; but in which enormous tracts of virgin forest still remain, from which, under judicious treatment, inexhaustible stores of timber may be drawn, as by degrees forest roads are completed through the valleys. Already excellent roads have been completed up through most of the principal vallies for the export of the forest produce, and indeed nothing has been left undone which good judgment and a thorough knowledge of the requirements of forest conservancy could suggest for the renovation of the forests.

14. The forests of the Patli Dún may conveniently be considered in the following divisions:—

I.—The forests of the Timuria and its affluents.
II.—The forests of the Mondhal.
III.—The forests of the Ramganga Valley, South Patli Dún, and Sona.

I.—The Forests of the Timuria and its Affluents.

15. This river, which has its source on the reverse side of the high ridges at the head of the Kotri Dún, and runs down with a South-Eastern course of about 25 miles into the Ramganga near Baxar, through its upper portion, bears the name of the Palin. It has for its affluents on the right bank the Khamsor and Monalti, and on the left bank the Halgada and the Bitlid and Bahlid (inner and outer) nullahs. The whole basin comprised within this water-shed contains a noble *sâl* forest.

16. The lower portions of this forest, especially along the right bank of the main stream, and along the plateaus and ravines near the exit of its various affluents, have been very considerably worked about ten years ago by the Agents of the Gun Carriage Department, and by Captain Read and Mr. Finn. But I have no hesitation in saying that the effect produced has been to their great advantange, as too much timber was not taken from them. Since the forest has been rigidly shut up, the immense improvement of the second class trees will be at once apparent to the most casual observer, as compared with the condition of the same class of trees in those portions of the forest which have never been worked. As the trees in the upper portion of the ravines are far too thickly placed together, and evidently fail to increase in size in consequence, opportunities should be taken of any demand for moderate sized timber to open the forests out more to the sun and light than they are at present. It is easy to observe how in such places the heads of the trees are bent out from the side of the ravines as if seeking for more light.

17. Lower down the valley towards the Ramganga River, all over the plateaus opposite the mouth of the Manalti stream at Chawulchura, and along the ravines to the mouth of the Bahlid nullah, the forests have been far too heavily worked previous to Mr. Finn's time. There are here, however, many fine old trees which, though unsound, have continued to shed their seed, and a large crop of seedlings and young trees is now springing up on all sides, some of which are already assuming noble proportions, and show the highest promise. On some of the plateaus, especially those which were formerly occupied by the old cattle stations, either on account of the nature of the soil, or injury done to the trees by the cattle owners before their removal from the forests, the show of young trees is not so good, but on the whole nothing can be more satisfactory than the present state of the young timber.

18. It is also most satisfactory to observe how, since these forests have been rigidly shut up, the whole surface of the ground is becoming thickly clothed everywhere with bamboos, by which the moisture is retained in the soil, the increase of other grasses prevented, the risk of fires materially diminished, and the young forests generally protected from harm, and their growth encouraged.

II.—The Forests of the Mondhal.

19. The Mondhal River takes its rise in the lower spurs of the Himalayas near the head of the Kotri Dún, and runs with an almost east course for about 30 miles into the Ramganga above Sarap Dúli. It is divided from the Timuria and Ramganga valleys by a high range of hills, over which there is a fair foot-road out of the valley of the Ramgunga.

20. The valley of the Mondhal itself is well cultivated, and possesses several decent villages, but the range of hills above alluded to is covered with fine *sâl* forests on the sides which slope down to the river facing the north. These forests, from their remote position, have never been worked, and though in a few places they bear the traces of having been cleared for cultivation, yet since the felling of *sâl* has been prohibited, they are even in such places fast recovering themselves; and as the villagers possess no cattle, no harm beyond the removal of the timber seems to have been done. There are here, in consequence, to be found an immense store of noble first-class *sâl*, as well as an abundance of trees of every age and size. The good forests may be said to extend over about 15 miles in length, through all the lower portion of the valley below Janit on the slopes and plateaus facing the north, and on the opposite bank of the river over the last 5 miles. On the plateaus immediately above the river the trees have attained a very large size, but generally speaking, they stand somewhat too thickly together, and would much improve if some of them were removed. But in order to effect this, and with a view to the sale of the wood, it will be necessary first to open a cart-road up the lower portion of the Mondhal valley into the valley of the Ramganga, and this will be a work of considerable expense, as the gorges become very narrow and precipitous on both sides near the mouth of the river. The work will, therefore, in all probability have to be done by a little at a time, as money can be spared for it, as the details of the working plan which it is my intention to propose, will not necessitate the carrying on of operations for the removal of the large timber in this valley for a number of years to come. In this valley, however, I propose at once to go on with the regular survey, as it will be most important to have an accurate estimate of its contents in order that we may know what reserve stock of timber we have in hand for future years, and may husband our resources accordingly. It should be mentioned that there is a large amount of fine *tún* in the valley which seems particularly well adapted to its growth.

III.—The Forests in the Valley of Ramganga, the South Patli Dún, and Sona.

21. All these forests, which are situated on the hills and plateaus sloping down into the Ramganga and its affluents, the Sona and Gauzira nullah on the right bank, and the Mira Soto, Patter Pani, and Dharao stream on the left bank, being generally in the same condition, may be conveniently considered together. In one word, they may all be said to have been *felled even to desolation* by Captain Read, as well as by Mr. Finn, and the native Contractors who went before him. From this felling it is satisfactory to state that in most places they are now recovering themselves owing to the fact that the hollow* and the unsound trees were spared when these operations took place. These trees have continued to shed seed, and over most of the ground (thanks to the vigor with which *sâl* reproduces itself whenever even moderate protection is afforded to it), young timber of every size is to be seen rapidly coming on, from the saplings of one year old to noble straight-grown trees of 2 or 3 feet in girth, and 60 or 80 feet in height. An exception to the above satisfactory state of things is seen where, in the lower valley, near the river, the felling of almost every tree has denuded the ground of all covering, so that the huge grass has been enabled to get a strong head, and has, by choking the surface of the soil, prevented the seed from germinating. That it is ready to do so is easily seen by the fact that, wherever from any cause the growth of the grass has been hindered, a fine crop of young *sâl* seedlings will be found coming up. I am not without hopes that, if we are successful in keeping jungle fires out of the valley, the grass will in time wither, and the reproduction of these forests be yet effected. What they must have been in past ages is easily seen from the size and symmetry of the gigantic old trunks which have been left standing.* At present the long grass gives cover to a number of wild elephants, but it is doubtful if the difficult nature of the ground would admit of their capture; and, as they seem to confine themselves to regular tracks, it is not apparent that they do any great damage to the young *sâl*. The exclusion of cattle for the last five or six years has worked wonders, and it is to this point and to the prevention of fires that attention should principally be directed.

22. It has been said above that these forests have been worked to desolation, but perhaps even this does not give an adequate idea of the waste that has occurred, and the mischief that has been committed. Thousands of trees were felled which were never removed, nor was their removal possible; and a large revenue has been realised during the last few years by allowing passes to the people of the lower country to cut up and to remove the dead timber on

* I measured one perfectly symmetrical though hollow tree on the banks of the Ramganga, 21 feet 9 inches in girth.

the payment of a royalty. There is also a very large export of bamboos from hence to the plains below. It may be added that, in several places along the Ramganga Valley, there are fine patches of *tún*.

23. The Patli Dún has lately been made accessible to carts by a good road constructed by the Forest Department through the lower range of hills near Kalagarh and leading into the Bijnaur District. For facilitating the removal of the dead timber and minor forest produce, this road will be of the greatest use, and will add considerably to the revenue of the valley.

24. Having now completed the Patli Dún we pass on to.

CHAPTER II.

The Kamaon Forests.

The Kamaon forests may be conveniently divided as follows :—

I.—The forests of the Kosila River.
II.—The Kamaon Iron Company's Grant (not Government).
III.—The forests of the Nindhor and Sirara Garinir Ranges.
IV.—The forests of the outer ranges, and in the Bhabar.
V.—The forests on the Sarda (Kuldunga).

I.—The Forests of the Kosila River.

25. In this section I have included all the tract of *sál* forest in Kamaon on both sides of the Kosila, north of Ramnagar, between the Ramganga on the west, and the boundary of the Kamaon Iron Company's grant, close the Dabka River, on the east, including the hills which have their water-shed towards those rivers, as well as into the Kosila. In area it is about 400 square miles. Deposits of both lime and iron occur in this section, which otherwise, in geological formation, does not seem to differ from the rest of the sub-Himalayan plateaus. A large portion of the above tract has been excessively worked by Native contractors in former years, and felling operations have also been carried on in the forests by the Forest Department during the past three years; but nevertheless it still contains a fair proportion of unworked forests. These are situated on both sides of the Kosila, the principal tract being the forests of Durgadeb, Timlipani, Kulbangadira, and Daudri, which are situated on the plateau between the Kosila and Ramganga, immediately below the main range of the Himalayas, and on the hills sloping down to the latter river. Durgadeb is the best of these, and is a noble forest, all the trees being straight and well grown, and of noble appearance, with clean barks and round, well-formed stems, and free from under-growth. A proportion of the trees, however, here as elsewhere, are unsound. From 8,000 to 10,000 mature sound trees may no doubt be taken from these forests without any injury to them. On the left bank of the Kosila the forest of Kuria Karak contains about 1,000 mature trees fit for felling, and below it, in the Kota Bhabar, a considerable number of mature trees will also be found, though in somewhat inaccessible places. On the higher ridges of the southernmost forests on the right bank of the Kosila, also a few hundred mature trees are to be still found.

26. On the left bank of the Kosila, east of Kuria Karak, are the forests of Bhujaket and Sirauli. About 9,000 first-class trees have been taken from these by the Forest Department during the past three years, and they are now entirely closed. I am of opinion that perfect discretion has been shown in the selection and felling of the trees here. In no case has the ground been too much denuded; there is an admirable show of thriving second-class trees throughout; and it cannot be doubted that in every way the general condition of the forests has been bettered by the removal of the timber which has gone out of them. There need be no hesitation in asserting when the time shall arrive to work these forests again, that many more first-class trees will be found ready for the axe.

27. In addition to the above, it is satisfactory to see some exceedingly fine and regular young forests springing up in this section. Among these, those of Amtunola and Chakar Nagal, east and west of the Durgadeb plateau, are conspicuous; they are almost as regular in appearance as plantations, and contain trees up to 3 feet in girth, and 50 to 60 feet in height. It is remarkable that the whole of the plateau on which these forests stand bears the marks of ancient cultivation, the trees springing up on the edge of the old fields. This is said to date from the time of the Chand dynasty, above a century ago, and one mature forest of trees has already been removed to make way for the forests which are now growing up. The young forests of Dioli Chaur, above Mohan, are also in the best possible condition.

28. The lower forests nearer the plains are not in such good order. On the plateaus and Chaurs above the Sajguri and Sunguri Sots, on the right bank of the Kosila, unsound trees of noble size show what the forests must have been, and a fair show of young trees growing up gives promise that there will be again good timber in those localities. Further south the Barra and Chota Panod and Chandi Chaur plateaus have been so extensively cleared in former years that a mixed forest of *conocarpus* and other jungle trees has made head, and to a large extent supplanted the *sál*, though in some places the latter is making a good show,

and coming on well. The best hope for the renewal of these forests must be in the practicability of totally excluding fires from them during the next few years; for it is wonderful to observe the immense number of young *sâl* seedlings which are now coming up on all sides, no doubt owing to the fact that the forest was not burned last year.

29. Immediately above the cultivated lands of the Bhabar, west of Ramnagar, the forests may be said to have been worked out; and as they are required as grazing grounds for the cattle of the Bhabur villages, nothing more can be done except to protect the *sâl* as a reserved tree from felling. There is a block of mixed jungle about 8 or 9 square miles in extent in the plains beyond Dhela, seven miles west of Ramnagar, in parts of which some fair young *sâl* trees may be seen; but, as a whole, I have not much expectations from it in point of quality, though, from its accessible position, it is by no means without value.

30. East of the Kosila, and stretching up to the Himalayas, is the Kota Bhabar, a sort of elevated plateau like the Dún, but more broken. The scenery is exceedingly beautiful in parts of it, and it contains some excellant *sâl* forests which have been enough worked to require rest, but not too much to prevent a very fine store of timber being obtained from them when it comes to their turn to be worked. It would be well to leave them for 15 or 20 years; but I believe there will be no occasion to work them before that time. The second-class and third-class trees are very fine throughout this tract. In this tract there are several villages with cultivation near the hills, but their limits have been strictly defined, and the people are not allowed to keep any buffaloes.

II.—The Forests in the Kamaon Iron Company's Grant.

31. This grant extends from the Manar Gudira, about one mile west of the Dubka, as far as the Bakra River, about half-way between Kaladúngi and Halwani. The grant is bounded on the north by the Himalayas, and on the south (towards the Bhabar) by a line of pillars. In area it is about 400 square miles. As the forests in this grant have been given away, I did not examine them minutely. But from having enjoyed perfect rest and protection, the young *sâl* seemed to be springing up vigorously in all parts, while good second and third-class trees, and in some places mature timber, is abundantly to be met with. The whole certainly forms a very valuable property.

III.—The Forests of the Nindhor and Siraragar.

32. These two rivers have their source in the lower ridges of the Himalayas, between Haldwani and the Sarda, close to each other, but run out of the hills in opposite directions, the course of the Nindhor being nearly west for 17 or 18 miles, and that of the Siraragar south-east for about 12 miles, till they reach the Bhabar, from which they are separated by high ranges of broken hills.

33. Both these rivers—not only as regards their main valley, and also the numerous ravines and sotes that appertain to them—are filled with a dense forest of nearly pure *sâl* slightly intermixed with *chir* in the upper portion, and in some places with trees of the lower, jungles. But the forests generally resemble so entirely those of the Palin and Mondhal that any particular description of them seems superfluous. Except in some of the lower portions, and on the side of the hills towards the Bhabar, they have never been touched by the hand of man. The trees generally are far too much crowded, and, in consequence, I think, are not generally of very large size, though no doubt noble trees exist in many places over so large an area of forest. But it is absolutely necessary that a series of foot-paths, which hereafter may be developed into forest roads, should be constructed through these vallies before even a proper or accurate examination of them can be made. At present they are simply an impenetrable thicket. I am quite sure that an enormous amount of timber might at any time be brought out of those forests to their extreme benefit, if only other considerations admitted of this being done. These conditions will be alluded to hereafter. There cannot be less than 40 square miles of virgin *sâl* forest contained in the area of these valleys. The geological formation is massive sandstone, with drift boulders and gravel.

IV.—Forests of the outer Range, and in the Bhabar.

34. In this are included all the belts of *sâl* which cover the plateaus and slopes of the hills, and which extend in many places far out into the Bhabar from Haldwani in the west, to the Sarda on the east. From their exposed position, as may be expected, everything worth taking away from these forests has long ago been cut down, and, except in the upper portions of the sotes or ravines, and high up on the ridges of the hills, mature trees do not exist anywhere: young forests, however, are springing up on all sides, which differ materially in quality in different localities. In some places, where the soil is suitable and other circumstances have favored the growth of the young trees, they are exceedingly fine and show straight stems, clean barks, and fine heads. In other places where the soil is poor, but more especially where the numerous cattle stations formerly existed, and where, in consequence, the young trees suffered continually from being lopped, barked, and otherwise injured, and where they were more exposed to repeated fires, the trees are knotted, crooked, and with poor heads. The best forests

are perhaps those west and north of Chargalia (where the old unsound trees which still remain are exceedingly fine in size and appearance), and those situated on the flats and plateaus above the Jagbura and kalania streams. *Tún*, as well as *sissu* and *khair*, are also coming on well in many places.

The main export, however, for some years, will consist of minor forest produce and bamboos, of which a large quantity is carried away to the plains from these forests.

V.—Sarda Forests.

35. About eight miles above Baramdio, around Kuldunga, near where the Ladia empties itself into the Sarda, there is a fine block of virgin *sál* forest. North of the Purnagiri precipice the hills recede somewhat from the river, and form a series of plateaus and flats terminating in ravines, which run up into the higher ranges of hills, all of which (both along the Ladia and the Sarda, for a distance of six or seven miles) are covered with *sál*, and from the favorable nature of the situation, the trees have developed themselves here in a very remarkable degree. Taking it all in all, this is one of the finest forests in Kamaon, and it now may be said to be at its prime. There appear to be very few old or unsound trees in the forest, most of the full-grown ones being from 6 to 8 feet girth, and 60 to 80 feet high, with younger ones of every age in abundance. It would seem advisable, after the clearing out of the Durgadeb block of forest, to proceed next to work this one, so as to get the sound timber out before the trees begin to decay.

There is a precipice below Purnagiri which has hitherto prevented the export of timber along the river bank, and this no doubt has saved the forest from being worked; but the rocks here can easily be removed by blasting, as the difficulty extends for a short distance only. In the centre of the forest is the village of Kuldunga, which has a large amount of cultivation round it. The presence of this village is no doubt objectionable, but its removal is impossible. Its boundaries have been accurately defined by the settlement officer.

CHAPTER III.

Timber and Revenue Statements.

36. From the following tables the annual income and expenditure of these forests will be seen at a glance since they were made over to Colonel Ramsay, the principal sources of revenue being shown separately in the tables:—

Statement of the Field of Timber and Revenue in the Forests of Garhwal and Kamaon.

Forests.	Year.	A I. Proceeds of Timber Sales.		A II. Sale of Dry Wood removed by Purchasers.		Revenue from Sale of Bamboos.		Grazing Dues.	Revenue from other Sources.	Total Receipts.	Total Expenditure.
		Cubic feet.	Revenue.	Cubic feet.	Amount.	No.	Amount.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
		A.	Rs. A. P.		Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Garhwal.	1859-60 ...	1,198,000	2,50,939 13 8	....	... ..	...	.....	.....	B. 53,881 1 2	3,04,820 14 10	2,56,809 2 6
	1860-61 ...	28,545	43,905 12 7	.....	.....	...	.....	... .	B. 74,527 1 3	1,18,432 13 10	94,540 10 10
	1861-62 ...	70,000	1,88,382 12 8	... ...	.....	...	.....	.....	14,102 12 1	2,02,485 8 5	80,133 0 0
	1862-63 ...	280,518	2,42,194 9 10	... ...	.....	...	.....	...	19,208 3 3	2,61,402 13 1	91,766 14 3
	1863-64 ...	801	17,355 14 5	... ...	...	..	.....	. ...	15,307 12 0	32,663 10 5	87,586 10 1
	1864-65 ...	389,219	2,06,373 12 9	1,000	250 0 0	648,000	5,400 0 0	504 4 1	5,213 15 10	2,17,742 0 8	1,09,104 4 6
	1865-66 ...	2,756	1,85,149 8 2	50,631	12,657 14 0	1,893,090	45,453 5 7	144 9 10	3,670 0 0	2,47,075 5 7	81,717 0 5
	1866-67 ...	96,814	1,11,181 10 2	177,368	44,342 2 3	22,671,734	56,245 10 11	60 0 0	16,121 0 0	2,27,950 7 4	55,919 4 3
	1867-68 ..	63,333	75,138 0 0	112,865	28,216 5 8	22,889,641	56,810 10 5	.....	16,630 0 0	1,76,795 0 1	52,488 0 0
		2,129,866	13,20,621 14 3	341,864	85,466 5 11	48,102,465	1,63,909 10 11	708 13 11	2,18,661 13 7	17,89,368 10 7	9,10,064 14 10
Kamaon.	1859-60 ...	606,349	2,30,388 9 9	.....	.....	...	... ...	.....	26,012 11 2	2,56,401 4 11	1,46,556 10 6
	1860 61 ...	373,523	18,131 3 0	.....	.....	...	.. ..	... ...	51,313 10 9	69,444 13 9	93,163 12 5
	1861-62 ...	1,926,111	67,621 1 11	... ...	.....	...	... ...	... ...	27,698 3 10	95,319 5 9	69,337 0 1
	1862-63 ..	285,081	1,11,689 2 7	.... .	.....	...	.....	... ...	23,727 14 5	1,35,417 1 0	1,00,929 12 1
	1863-64 ...	157,304	52,278 1 0	.... .	. ..	.	... ...	... ...	16,603 5 8	68,881 6 8	62,354 4 1
	1864-65 ..	211,435	2,44,888 15 7	. . ...	... ..	...	.. ...	.....	39,904 1 9	2,84,793 4 4	1,03,630 13 6
	1865-66 .	37,160	2,31,104 11 5	23,792	5,947 15 9	1,763,396	4,473 1 9	7,862 10 6	10,155 5 6	2,59,543 12 11	61,800 13 11
	1866-67	82,945	57,060 15 0	120,555	30,138 8 3	3,022,376	8,258 4 11	9,809 12 2	52,291 3 10	1,57,558 12 2	86,024 0 4
	1867-68 .	128,315	1,15,796 0 0	105,029	26,257 3 7	2,568,739	10,274 6 0	10,977 2 4	10,425 13 8	1,73,730 9 7	1,09,680 0 0
	.. ..	2,074,723	11,28,958 12 3	249,376	62,343 11 7	7,354,511	23,005 12 8	28,649 9 0	2,58,132 9 7	15,01,090 7 1	8,33,477 2 11
	.....	4,204,589	24,49,580 10 6	591,240	1,7,810 1 6	55,456,976	1,86,915 7 7	29,358 6 11	4,76,794 7 2	32,90,459 1 8	17,43,542 1 9

A.—Includes a balance of 452,380 cubic feet from previous year.

B.—Includes revenue from Captain Read and Mr. Johnson's timber.

Balance in favor of the forests in nine years, Rs. 15,46,916-15-11.

37. Having expressed myself strongly on another occasion against the collection in the Dún, by Kham Tasil, of the revenue on minor forest produce, I feel bound to state that, as far as I have been able to judge, the same system has worked in Garhwal and Kamaon in a perfectly satisfactory manner. The large revenue realised from this source, and the small charge on its collection (about 6 per cent.), sufficiently attest the truth of this statement. But the natural condition of the two divisions are very different. In Kamaon and Garhwal almost every portion of the forests is readily accessible by excellent roads, so that it is more profitable to exporters to carry their bamboos and timber out of the forests along such tracts past the forest chowkees, and to pay a small duty on their export, than to smuggle them out over difficult and precipitous mountain paths. But across the Ganges, although there is a fair road along the south side of the Siwaliks in the Dún forests generally, the system of roads (projected by the Commissioner of Mirat) has yet to be carried out. Moreover, in the Dún the forest boundaries are enormously multiplied by the intermixture of private grants, which add very greatly to the facilities for smuggling and to the difficulties of watching the forest. It would not, however, be fair to attribute the whole of this satisfactory result in Kamaon and Garhwal to such causes as these, and no doubt much also is due to the praiseworthy vigilance and thorough knowledge of the country and people which the Messrs. Thompson have brought to bear on this part of their duty. Nor would I omit the name of Motiram Sa, the Banker of Nyni Tal, who has been of great service to the Department in many ways, and to whom the whole of the responsibility connected with receiving the collections and remitting them to the treasury has been entrusted for a small commission; and who, through his own good character, has no doubt greatly influenced the Native subordinates of the Kham Tasil establishment for their good.

CHAPTER IV.

Present condition of the Forests.

38. The management of the Garhwal and Kamaon forests was first taken in hand by Colonel Ramsay after the mutiny. Previous to that period it is to be feared that but little consideration either for economy of the timber, or the future welfare of the forests, was shown by those to whom the responsibility of working them was entrusted. Felling of trees without permission was then first prohibited by Colonel Ramsay when he took charge, and forest officers were appointed. From that time conservancy has progressed with vigour. In 1861-62 the cultivation in the Patli Dún was put a stop to by assigning land to the people below the hills in the Bhabar; next the cattle stations were broken up, and all herds of buffaloes removed from the forests. This operation occupied three years, from 1862 to 1865, the cattle stations being removed from all the Garhwal forests, and in Kamaon from all the forests above the main line of road. In the meanwhile excellent roads were opened out, and the forests, especially those of Garhwal, were made accessible from all sides: at the same time a regular system was instituted of working only certain forests, the remaining ones being kept rigidly shut up, and the selection and marking of all trees previous to felling being insisted on. The clearance also of the forests from old timber, which, after the operations of Captain Read and the contractors who preceded him, lay scattered over all of the forests, was commenced, the wood being removed by Native merchants on payment of a small royalty which has brought in a handsome revenue now for several years, and has not yet entirely ceased. In 1867-68 forest fires were successfully excluded from all Garhwal and from most of the Kamaon forests.

39. As regards their present condition, it will be seen from the preceding description that though in the years prior to the introduction of the present conservancy arrangements the more accessible forests have been heavily worked (in some places even to utter desolation, so that their reproduction can hardly be looked for), yet that many portions of them still exist where timber has never been felled at all: while in the others, though felling may have been carried on, a considerable number of trees can still be taken away without injury. In other places the trees are growing so closely together that they cannot develope themselves to their full size, and the removal of a portion of them is desirable for the benefit of the rest; while in almost every forest a large number of partially unsound trees is found, many of which will bear removal, and will yield a large amount of good wood.

40. Generally, the second and third-class trees are in a most flourishing condition, and the entire rest which the forests have enjoyed since they were shut up has borne marked fruit in their improvement. This result is best seen in those forests which were partially but not too heavily worked in past years.

41. The growth of the young trees and saplings in almost every case is most satisfactory, and is a standing proof of the immense benefit that has been effected by the removal of the cattle and the exclusion of fires, when one looks at thriving young trees of every size, from the smallest seedlings to the young giants of 50 or 60 feet in height, and two feet in girth, growing up with fine clean barks and straight stems, and all full of the highest promise, the mind is filled with good hope that future ages will see these valleys and plateaus covered with forests far greater in value than those that went before them, inasmuch as they

will benefit by regular protection and conservancy, which their predecessors did not enjoy. Indeed, the virgin forests which actually exist are by no means the best ones we have.

42. The only portion of the forests which can be looked on as forming an exception to the above, are those in which, from being overworked, the grass has got to such a head that it chokes the ground entirely, and renders it impossible for the seed to germinate. It is very difficult to know how to act here, as, in order to do any good, the huge grass must be got rid of. It is to be hoped that if fires can be effectually excluded for a number of years, it will wither and die, as there are in most cases still quite a sufficient number of old trees on the ground to furnish seed, if only the grass could be removed and the ground cleared.

CHAPTER V.

FUTURE YIELD OF THE FORESTS IN TIMBER.

43. I think this should be divided into two parts, *viz* :

1st.—The yield from the regular annual fellings.
2nd.—The yield from conservancy operations.

44. The former must be carried out agreeably to a regular working plan drawn up with a view to the removal of a certain proportion of the mature sound timber every year; the latter will be the result of such operations as from time to time may be executed for opening out and improving the forests. I have now been in the habit of watching *sâl* forests for about ten years, and the inspection of these Dúns very much confirms the opinion to which my mind has for some years been tending, *viz.*, that both for the free germination of the seed, and the effectual reproduction of the forests, as well as for the welfare of the trees, and their progess afterwards, *sâl requires a considerable amount of sun and light*; and that a *sâl* forest will bear, and indeed repay (if it does not absolutely require) much more liberal felling than almost any other description of forest in India. Yet this felling must be carefully limited in such a degree that the grass and the scrub jungle should not get head instead of the young *sâl*; for if it does, the latter will infallibly be choked and perish. It is impossible, however, to see any forests, even where heavy felling has been carried on, provided sufficient cover has been left to prevent the coarser descriptions of grass getting hold of the ground, where the growing trees of all classes do not show a marked improvement in their appearance over those in forests which have never been touched. Moreover, for the actual free germination of the seed of the *sâl* tree, it is absolutely necessary to open the ground to the light and sun—a fact which the most cursory examination of a *sâl* forest will at once show.

45. In regard to the amount of felling which a *sâl* forest will bear with safety, I believe that in almost every case every sound first class tree may be removed: for, where the second and third class trees are abundant, they protect each other; and where this is not the case, we may be sure that the forests are old, and that from 20 to 50 per cent. of the trees are more or less unsound. The unsound trees are quite as good both for seed shedding and protective purposes as any others, and the proportion of them to be removed must depend on the ratio they bear in the forest to the sound ones. But every forest must be treated on its own merits; and, indeed, there are hardly any two portions of the same forest which will bear exactly the same amount of working.

46. For the above reasons, as well as on account of the immense benefit which accrues to young *sâl* from perfect rest, I am led to advocate a plan of working these—and, indeed, all *sâl* forests,—the basis of which should be the division of the forest into blocks, each of which should be worked in succession to the *full extent* it will bear with safety, after which it should be shut up for a full period so as to allow the second class trees to become first class. As from seven to ten rings may be generally counted in one inch of the radius of a well-grown *sâl* tree, I am induced to think that this period may be estimated as from 30 to 40 years.

47. With a view to obtaining data to frame a working plan based on the above principles, I have directed an enumeration to be made, by the Rangers and Patrols, of all first class trees in the forests which have not yet been worked—the sound and unsound trees being counted separately. But the system of linear surveys, which is said to be well adapted to some forests, would not answer here, inasmuch as the unsoundness of the trees, which exists in a very different ratio over the forests, contributes so large a disturbing element to all calculations of the value of the timber, that the truth of any estimate based on them would be considerably invalidated.

48. From the data thus obtained, a tentative working plan will be drawn up and submitted for the sanction of Government, and by it the annual yield of the forest in sound timber will be carefully ascertained and defined: but after the inspection I have made, I believe, I may safely commit myself to say that Colonel Ramsay's estimate of one lakh cubic feet per annum from the forests of both divisions may confidently be reckoned on, besides whatever is obtained by the removal of partially unsound trees and from thinnings. The

regular survey of the forests will follow, and by it the estimate now obtained will be checked, and the working plan corrected accordingly.

49. With regard to the second head—*viz.*, the thinning of forests which are too closely packed,—this must be looked on rather as a conservancy operation than as a source of revenue. It must be borne in mind that the best trees will in almost every case be left standing, and that the sale of a large quantity of more or less indifferent wood in distant localities will not in all probability yield much profit. Moreover, it must be carried out absolutely under the personal inspection of the forest officer himself—every tree being selected entirely with a view to the effect which its removal will have on those which are left standing, and not on its value as a timber tree. It must be remembered too, that the forests where these operations are mainly required are those which from their inaccessibility have hitherto escaped the axe, and the making of roads must in every case precede the act of thinning out the trees. But I feel no hesitation in saying that if half the trees were cut down in the untouched portion of the Palin forests, as well as in the Mondhal and Nindhor Vallies, the remainder would benefit beyond all calculations by the operation.

CHAPTER VI.

Future Management.

50. Under this head but little can be done except to mature and consolidate the sound system of conservancy which Colonel Ramsay has commenced, and with this view, in addition to the exclusion of fires and cattle, which, of course, must be steadily persevered with, the following points would seem now to demand special attention :—

1*st.*—The completion of a good and correct set of forest maps for the whole tract, on a large scale.

2*nd.*—The framing of a regular working plan of the forest.

3*rd.*—The opening out and thinning of the virgin forests.

4*th.*—The gradual extension of the forest roads, especially in Kamaon.

5*th.*—The compilation of a proper record of the State rights in the forest, or "Register of the forests."

51. Arrangements have been already made for taking in hand the first two of these works, and both will be materially facilitated when the maps, which are now in course of preparation by the Topographical Survey Department, are completed. The third and fourth points must necessarily be a work of time, as both of them will demand not only money, but also the personal supervision of well-trained Officers, which cannot always be afforded, and both, as stated above, will probably depend in some degree on the possibility of finding a sale for a large amount of second-class timber.

52. In regard to the last point, it would seem most necessary that the compilation of a proper record of the rights of the State, as well as of the rights of the people, in reference to these valuable forests, should be no longer delayed. Rights so important, and property so valuable, must not be left to be dealt with by individual knowledge or caprice, and moreover, it is highly desirable that they should be placed on a legally-defined footing. To this end, then, it is proposed to issue instructions for the preparation of a descriptive register of the forests, showing all their boundaries, and noting such rights as it may be necessary to concede in regard to them. When this is completed and revised by myself, it will be submitted to the Commissioner, in order that all points involving the rights and interests of the population of the Hills and Bhabar may be fully considered. When all these have been determined, the record shall be submitted to Government for sanction, with a view to the forests being declared State forests under the Forest Act.

53. In conclusion, although anything in the shape of commendation in a public report would, as a rule, almost seem to savor of presumption when expressed in reference to an officer who is so much my senior, and who bears so high a character as Colonel Ramsay does, yet I trust that it may not be considered that I am trespassing beyond the proper bounds of duty, if, after a most minute and instructive examination of every part of these forests, which has occupied me for the whole of two months, I desire to place on record how strongly I have been impressed with the very perfect system of management that officer has instituted and carried out in them. It would be difficult to over-estimate the value of Colonel Ramsay's services to Government in these respects : indeed it is I believe not too much to say that no officer who did not possess the local knowledge and influence which Colonel Ramsay brought to bear on the work, could have effected so much in the same time. And after having been in the Forest Department myself for nearly nine years, and after having seen something of the system followed—not only by myself in the Central Provinces, but also in the Madras Forests, in Bombay, and in the Panjab—I would desire to testify that perhaps in no forests in India has so much sound progress in forest conservancy been accomplished on so large a scale as has been effectually carried out in the *sal* forests of Garhwal and Kamaon. To Colonel Baugh—who has had charge of the conservancy arrangements, and to whom the delicate task was entrusted of dealing

with the cattle owners who have been excluded from the forests, and who in connection with the Settlement Officer, Mr. Beckett, completed the arrangements for suppressing unauthorized cultivation within the forest limits—every possible commendation is due for the tact and success, as well as for the thorough manner in which this has been carried out. The same is due to the Messrs. Thompson, but especially to Mr. R. Thompson, who has been in the forests since Colonel Ramsay took charge of them, and who possesses great local knowledge, as well as some scientific attainments; and a thorough experience in forest work in all its branches. Both of these officers have had charge of the timber arrangements, road-works, and kham tehsel management, and both of them, but more especially Mr. R. Thomson, have done these works right well. I was glad also to observe that they were both well and kindly spoken of by the native population in the forests.

No. 430F, dated 15th September, 1869.

RESOLUTION,—By the Government of India, P. W. Dept.

Read—

An endorsement by the Government, North-Western Provinces, No. 80F, dated 17th March 1869.

OBSERVATIONS.—The Government of the North-Western Provinces forwards a report by Major Pearson, the Conservator of Forests, on the Sâl Forests of Kamaon and Garhwal.

2. This clear and valuable report has been read by the Governor General in Council with the greatest interest, and the commendation bestowed upon it by His Honor the Lieutenant-Governor is fully and cordially endorsed by the Government of India.

3. The Governor General in Council has noticed with great satisfaction Major Pearson's description of the successful results of the measures initiated by Colonel Ramsay, the Commissioner of the Kamaon Division, to whose able management is mainly due the sound progress in forest conservancy which has been accomplished on so large a scale in these forests: and desires to express his acknowledgment of the eminent services rendered by this officer to the cause of forest conservancy at a time when forest administration occupied little of the attention either of the Government of India or of the local authorities.

4. The forests which are described in this report are represented as forming one almost unbroken State Forest domain, in which *sâl* is the principal tree, and in which there are, besides *sâl*, numerous other kinds which will eventually yield a good revenue. The southern boundary towards the Terai of these valuable estates is reported to be well defined and demarcated by roads, rivers, and lines of boundary pillars; the Ganges and Sarda Rivers form the limits on the two sides, and towards the north, it is inferred from the report that, there is a good natural boundary, and that demarcation by the boundary marks is not required.

5. A few villages only form enclosures in this reserve, and Major Pearson says that they do not affect the actual forests in any way. The majority of the villages, it is said, have been removed by Colonel Ramsay outside forest limits, the people having been compensated by the grant of land, and in some cases by the payment of money.

6. The position and the principal divisions of these forests are well illustrated by a sketch map appended to the report, which also shows the principal tracts of mature and of young *sâl* forests. Besides a few compact masses of mature forest which have not been touched, being difficult of access, and not easy to work, a good deal of mature timber is scattered over the younger and middle aged forests.

7. These forests were worked in a reckless manner until 1859, when the Commissioner, Colonel Ramsay, took charge of them. Up to 1869, the principal improvement effected was the removal of villages and of the herds of cattle which formerly resorted to these forests.

In 1864, the Government of India sanctioned an increased establishment for their management, and the principal improvements which are described by Major Pearson in terms of high approval, appear to have commenced from that time. The Government of India has repeatedly acknowledged the value of Colonel Ramsay's services for the conservancy of these forests, but the present report shows that far greater progress had been made in a sound and well-considered system of management than was gathered from Colonel Ramsay's own reports.

It appears from Major Pearson's Report that cattle have now been almost entirely excluded from the more valuable portions, and that some parts of the forests have been successfully protected against fires. Further, it is distinctly stated that the selection by responsible officers of all trees previous to felling has of late been insisted on. This is a great step of progress, and so great has been the success of these excellent measures, that the forests are described by Major Pearson as being under a perfect system of management.

8. Excellent roads have been formed to facilitate the working of the different parts of the forests, the old wood which gave additional food to the jungle fires, is sold on the spot, and exported by purchasers; and the levy of dues by direct Government agency has been put upon a satisfactory footing and has yielded satisfactory results.

9. The yield of the forests during the nine years of Colonel Ramsay's administration is illustrated in an abstract statement which accompanies the Report. Accepting the figures of this

statement as correct, the yield in timber exported by the Forest Department has been 4,204,589 cubic feet, realising Rs. 24,49,580, or 9,343 tons (at 50 cubic feet) annually, which have been sold at an average rate of Rs. 29 a ton. This yield, however, has fluctuated within wide limits, and the rates realised have of late risen considerably. Latterly the rates appear to have been about Re. 1 per cubic foot. The future yield of the forests is estimated at 100,000 cubic feet, or 2,000 tons of timber annually. If this estimate of the normal yield is correct, it would appear that the outturn had been anticipated considerably; but it should be borne in mind that a portion, *viz.*, 4½ lakhs of cubic feet sold in 1859-60, was timber cut by those who had charge of the forests before 1859.

Of dry wood sold in the forests, 591,000 cubic feet were exported since 1864-65, realising Rs. 1,47,800.

Of bamboos, 554 lakhs since 1864-65, realising Rs. 1,87,000, or at an average rate of 5 annas for 100 bamboos.

Lastly, minor forest produce has yielded Rs. 4,76,800, and grazing dues Rs. 29,400.

10. The total financial results have been—

	Rs.
Receipts	32,90,500
Charges	17,43,500
Surplus ...	15,47,000

11. The Governor General in Council deduces from the figures given in the Report that the area of the *Sál* Forests of Kamaon and Garhwal may be estimated at about 1,000 square miles. Adopting this figure, the gross revenue would appear to have amounted

	to Rs.	3,290	per square mile	in 9	years,	or	Rs.	365	annually.
the charges	to „	1,743	per „	in 9	„	or	„	193	„
the net revenue	to „	1,547	per „	in 9	„	or	„	172	„

This amounts to about 4 annas per acre net revenue per annum.

The yield in timber appears to have been 467 cubic feet per square mile annually, and the future estimated yield is 100 cubic feet per square mile of 640 acres.

This is a very small yield, and it is clear that the productiveness of the forests is capable of great improvement.

12. In Chapters V and VI, Major Pearson gives general proposals for the future management of the forests.

He proposes to prepare, in conjunction with the Commissioner, a statement of the rights of Government and of the population in these forests. This will be an important measure in the right direction. The Conservator's proposals for the preparation of a set of forest maps for the whole tract on a large scale, for valuation surveys, to determine the quantity of growing stock available, for the framing of regular working plans for each division, for thinning operations, and for the making of forest roads, appear to be excellent, and are approved by His Excellency the Governor General in Council.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Government of the North-Western Provinces for information and guidance.

APPENDIX C.

REPORT ON THE BHAGIRATI VALLEY FORESTS IN THE N. W. PROVINCES.

From COLONEL C. J. HODGSON, R. E., Secy. to the Govt. of the N. W. P., in the P. W. Dept., to Conservator of Forests, North-West Provinces, No. 302 F, dated 7th December, 1869.

Acknowledges the above, giving cover to Map and Valuation Surveys of the Bhagirati Forests prepared by Mr. Grant, and intimates that the Report and Map are creditable to Mr. Grant, to whom the satisfaction of this Government should be expressed for the complete and careful manner in which he has executed the work entrusted to him.

2. The Map and Valuation Surveys, together with the Conservator's Report, will be published in the "Selections" of this Government, and copy of the Report and Statement, with Map, will be forwarded, as requested, to the Government of India.

No. 303 F.

Endorsed by the Govt. of the N. W. P., in the P. W. Dept.

Copies of Survey Statement and Conservator Report, with Map, and copy of above, forwarded to Secretary to the Government of India, Public Works Department.

From MAJOR G. F. PEARSON, Conservator of Forests, N. W. Provinces, to Secretary to the Govt. of the N. W. P., in the P. W. Dept.. No. 233A, dated 7th November, 1869.

Bhagirati Valley Forests.—The Conservator has the honor to submit herewith the Map and Valuation Surveys of the Bhagirati Forests, which have been prepared by Mr. Grant during the past season. They will give the Government a very accurate idea of these valuable though distant forests, and carry with them the most favorable impression of the zeal and ability with which Mr. Grant has carried out his work in these difficult and distant mountains, to which the Conservator would desire to solicit the favourable attention of Government. The forests of the Jadh Ganga (which joins the Bhagirati from Nilang about 8 miles below Gangutri) are not included in this Report, and will be surveyed another year.

2. The Conservator will now append his own remarks on the general condition of the forests, after having been able to spend some time in them. The inspection last year was a very cursory one, but he has not seen reason materially to alter the opinion he then formed.

CHAPTER I.

3. *General description.*—Just above the point where the Bhagirati cuts through the snowy range is situated the village of Jhala. Between this point and Gangútri the valley lies nearly due east and west. It is about 17 miles in length between these points, and this portion of the valley contains the *Deodar* Forest. *Deodar* extends for about 2½ miles above Gangútri, but it is generally stunted. The *chír (Pinus Excelsa)* extends 8 miles higher up the valley above Gangútri, and the *birch* is found in patches up to within half a mile of the glacier. The surveys were only carried up as far as Gangútri.

4. Agreeably to my directions, Mr. Grant divided the forests into convenient blocks, bounded by natural features—the several blocks of forests being called by the names of the *gads* or streams which bound them to the east. The upper survey line was carried along the edge of the forest below the snow; valuation lines, two chains in breadth, were then taken through the forest as far as was possible. These are all indicated in the Map. The trees were carefully counted along the lines, distinguishing the sound from the unsound, and averages were then struck for the whole block from the number counted along each survey line, as per its average.

5. A description of each block in succession, commencing from the east along the north bank of the river, and returning up the south bank from the west, will now be given.

6. *Gangútrí Block.*—This block extends from the junction of the Jadh Ganga with the Bhagirati up to the Gangutri temple. It is a narrow strip of forest containing somewhat less than 600 acres. The rocks are granite, the hill sides excessively steep, and the river runs nearly the whole distance between perpendicular cliffs from 200 to 500 feet in height below the forest.

7. Some of the finest trees in the whole forest are in this block, and several were measured of 16 feet girth and upwards, and from 100 to 200 feet in height. Those, however, to the east are somewhat stunted and broken, but they are no doubt of great age—the two trees above the temple being supposed to be even 1,500 years old. Above the Jadh Ganga, there is a close forest of young trees springing up in the old cultivation, and generally the proportion of young trees in this portion of the forest is good, as will be seen by a comparison of the number of third and fourth-class to mature trees. This forest has not been much injured by avalanches, but the damage from fire and barking of trees in former times has been considerable. There is a fair quantity of *Pinus Excelsa* mixed with the *Deodar*, but no other tree. This block has not been worked except to a very small extent by Mr. Wilson.

8. *Nilang Block.*—Extends from the Jadh Ganga or Nilang River westwards as far as the Gúmgúm River. The characteristics are generally the same as those of the last block. It contains some very fine forests, and a very fair show of young trees in portions of it. But it has suffered terribly from avalanches; and where they have fallen, the forest is utterly destroyed. It is a convenient forest to work, and will yield much good timber.

9. *Gúmgúm Block.*—The valley here becomes more open and the forest closer. The trees are generaly not of such large size. But a vast proportion have been burnt and killed for the cultivation of the Makwa people in former years. Though not included in the estimate of the forest, they will yield a quantity of timber for sleepers independent of the living forest.

10. *Hirsil Block.*—Has been heavily worked by Mr. Wilson in past years, while great numbers of trees were destroyed before his time for cultivation. There is, however, a good deal of timber left available for use.

11. *South side of the river: Tailguri Block.*—The same remarks will apply as to the Hirsil Block. There is a fine forest of *excelsa* and *silver fir* mixed with, and above the *deodar*, in this block.

12. *Sarti Block.*—The older trees have been generally felled in this block, but there is still a good amount of fine timber (*deodar* and *chir*), while a fine young forest of young *deodar* and *chir* is now coming on. Above the *deodar* there is a fine forest of *silver fir (Webbiana)*—the trees being of enormous size: but they are of great age, and generally unsound. Some portions of this block have been dreadfully injured by fire, and numerous fine trees have been destroyed for the temporary cultivation of the Darali village. The *deodar* forest, west of Darali, is, however, as fine as any I have seen almost anywhere.

13. *Dudugad Block.*—This large block of forest contains a vast quantity of fine timber. The average of the surveys shows about 25,000 first class trees, but this is certainly well within the real number. The forest has been considerably worked heretofore in certain parts, but not all over, and it has been much devastated by avalanches. The young forest is particularly good in portions of this block.

14. *Dinargad Block.*—The mountains here are exceedingly precipitous, and the forests very inaccessible. They may, however, be got at in almost every part by light wire-rope bridges across the river from the north side; while an immense amount of valuable timber is available, if only it can be put into the river without being broken to pieces over the precipices. The number of trees shown in the statement is certainly well within the number which exist in the forest.

15. *Kidar Ganga Block.*—This forest is opposite to the Gungutri temple. The trees are generally stunted, the aspect being cold and enjoying but little sun. Nevertheless, in many places, fair young forests may be seen coming on, and, on examination, it seems better than could be expected in such a situation.

CHAPTER II.

16. *General Condition of the Forests at present.*—It must be confessed that these forests bear a very desolate appearance on first looking at them, if their true value be not carefully gone into. The ravages committed by the cultivators in the western portion of the valley, where thousands upon thousands of dead trees—all killed by fire—disfigure the hill side in every direction, are barely equalled by the destruction committed by avalanches higher up the valley. Here, in the Nilang, Dinargad, and Dudugad blocks, huge lanes may be seen swept clean down the hill side by avalanches, the whole place strewed, right and left, with the *debris* of trees hurled down and broken in pieces, from small saplings up to trees of 12 and 15 feet in girth in one common destruction. Then, again, the forests having been worked formerly on no regular system, the whole place is strewed with loppings and tops

of trees, and half-decayed logs. Added to this, from the height of the mountains, the sun disappears entirely from the valley by half-past 1 or 2 o'clock in the afternoon, and does not rise till half-past 8 in the morning, the frost being exceedingly severe, while cutting winds blow all day long, and snow in this month (November), lies far down the side of the mountain. All this is against natural reproduction, and makes one wonder how such fine trees have ever been produced as are seen here.

17. The rate of growth, however, is no doubt very slow. Although there are exceptions, and specimens of very good growth may be found in the valley, yet, after examining many trees, the Conservator considers that *eight rings per inch* may be taken as a fair average of the rate of growth in these forests, or about 200 years for a tree of two feet in diameter. Many stumps showing an age of upwards of 400 and 500 years have been counted by the Conservator, and one containing about 420 rings measured under 4 feet. In the Hirsil block one stump was counted of 7 feet diameter, with only 320 rings, and the rate very much varies according to difference of situation; and this happens also where trees are within a short distance of each other in the same block.

18. *Proposed Improvements and Plan of Working.*—It is very remarkable that, where the forest has been cut down by avalanches in no case can any young tree be seen coming up again. The ground becomes covered with scrub jungle, and the forest disappears.

CHAPTER III.

19. As a large amount of timber must be taken from these forests during the next few years, it becomes important to consider the best plan of working them. After carefully considering the matter, the Conservator feels convinced that the plan of felling in lines, leaving intermediate lines of trees between, will not do here. The shelter of older trees is absolutely necessary to let the young ones take root, and obtain shelter in this bitter climate. Indeed, the action of nature with regard to the avalanches, which, as it were, fell regular lines of trees through the forest, seems to show us that such a plan would never answer, as the forest never springs up again in such places. He believes that the best plan will be to take as many of the sound first-class trees out of the forest as it will probably bear without denuding the ground, or depriving the young trees of shelter, and then *shut it up absolutely*, not allowing any workman to enter it. For the present, felling will be confined to the four western blocks, and to certain limited portions of those blocks which it may be convenient to work. Moreover, every effort will be made to utilise as many of the dead trees, which exist in great numbers in these four blocks, for sleepers. Many of them are perfectly sound, and the timber seems excellent, and of course thoroughly seasoned.

20. As regards what may be called putting these forests into order, collecting and burning the *debris*, and such like, the Conservator really does not see where he can even begin with profit. To make any perceptible change in this point of view, would entail a vast amount of money, and much labor, which is difficult to procure. He believes that, as regards the future, we must insist on clearing up the work as we go on, and, little by little, remedy the past in the forests in which we may be working.

21. In the meanwhile pains will be taken to keep the present work straight, and as it should be. The villagers are no longer allowed to burn the forests for cultivation, or to bark the trees. There is very little sheep grazing, especially in the upper part of the valley, as the sheep are all constantly employed in journeys to Thibet. Even with all the drawbacks that exist, Government may rest assured that the rent they pay to the Rajah of Tehree for his forests (of which these are only a small portion), even if supplemented by the cost of the Bhagirati Valley Road, is well laid out, and that they ought to get a handsome return in the shape of timber for their money.

22. Proposals for the work of preparing the sleepers required for the Dehli Railway are submitted in a separate document.

CHAPTER IV.

23. *Concluding Remarks.*—In this report the Conservator has endeavoured to give a general idea of the condition of the forests, apart from figures which are contained in the table which is appended, and which gives a carefully compiled statement of the contents of the different blocks of forest, at a glance. This seems the most useful way of showing it; and, indeed, from this table the condition of each block of forest can be better told than in the report. It should be remarked that only first-class *chir* trees are counted.

24. In conclusion, he would add a few words on the forests of the Jadh Ganga, or Nilang River; on the condition of the Bhagirati for floating; and on the progress of the road during the past year:—

1*st*.—As regards the forests of the Nilang Valley, which will be surveyed, if possible, next season, the *deodar* extends for about 12 miles up the valley and contains some very fine trees, but there is very little appearance of young forest. The terribly cold winds, which tear up and down this valley, must, it is supposed, carry away the seed from place to place, and prevent it germinating. Nevertheless, a considerable amount of mature timber may be taken from the valley.

25. In the upper portion, towards Nilang, the pencil cedar (*Juniperus excelsa*) is found in considerable abundance; but it has been much cut for fuel by the Tartars, who come to the valley with their sheep, and but few trees of any size exist. Neelung is about 10,000 feet above the sea, and it grows close up to it.

26. *Floating in the Bhagirati.*—There will be difficulties in regard to this matter, which did not strike the Conservator when he made his hurried journey up the valley last year at this time. The upper portion of the gorge is so bad, that sleepers could not be floated through it (as he hoped) in the cold weather—in the floods they would be dashed in pieces. Below the gorge, the river, it is believed, presents no difficulties; but perhaps it will be better to launch the logs in the floods, when they will be carried through the gorge, and then they can be cut into sleepers where they are stranded below the gorge, or in the Dún, if they get so far.

27. The Conservator believes that it would not take very much to improve the bed of the river for floating to such an extent that sleepers might easily be floated with safety in the cold weather through the gorge. But without a survey of the river, he does not like to speak positively on this point. Such a survey will be made whenever Mr. O'Callaghan has leisure to attend to it, and then some calculation may be entered into as to the cost of opening the river in the gorge. Perhaps the best plan would be to spend a small sum (say a couple of thousand rupees) every year in blasting away the worst impediments. Below the gorge there is certainly nothing worse in the river than there is between Agastmuni and the Dún, whence we know that sleepers were floated last March and April with ease and safety.

28. *Progress on the Road.*—Much good work has been done between Batwari and Jhala through the gorge by Mr. O'Callaghan. The Mila-kâ-Chaun precipice has now a practicable path along its face, and only one really dangerous place below Suki remains. This will be examined by the Conservator carefully as he goes down, as he believes it will be better and cheaper to construct two wire-rope bridges and turn the precipice by going along the opposite bank of the river, rather than to attack it direct. Two good wire-rope bridges have been substituted for the two most dangerous of the old temporary bridges, and materials are on the ground for the four remaining ones, which are being put up. When these are completed, access to the forests will be comparatively safe and easy.

29. The Conservator fears, from Lieutenant Gracey's report, and other's that he has heard, that a good deal of the work on the lower part of the road has fallen in during the last monsoon: probably, however, this will not take much to repair.

30. If the forest road be opened up to Jangla, it can hardly be but that it should be completed eventually to Thibet. From Jangla to the foot of the pass, only about six miles, present any real difficulty, and the Tartars say that they always ride their *yaks* above Nilang right into Thibet all the way up at present; there can be no doubt the trade in borax and salt along it would repay the completion of this part of the road.

SURVEY STATEMENT OF THE BHAGARATI FORESTS.

Statement showing total number of trees per acre, as well as per block, in the Bhagarati Forest, as per Valuation Survey made by A GRANT, Esq., *Forest Department.*

Name of Block.	Acres.	Total Number of Trees per Acre.								Total Number of Trees per Block.								Remarks.
		Deodar, 1st class.						Chir.		Deodar, 1st class.						Chir.		
		Sound.	Unsound.	2nd Class	3rd Class.	4th Class.	Total.	Sound.	Unsound.	Sound.	Unsound.	2nd Class.	3rd Class.	4th Class.	Total.	Sound.	Unsound.	
1.—Gangutri Block ...	585	13	1	9	19	29½	71½	2		7,605	585	5,265	11,115	17,257½	4,187½	1,170	...	Soil and rock granite, with mica-schist, in some places south of the river. Sides of the mountains very precipitous, especially in blocks 1, 2, 7, 8, and 9. North of the river, and in blocks 7, 8 and 9, on the south side, nearly pure *deodar* forest. In other blocks, and partly in 7, *Pinus excelsa* is mixed with the *deodar*. In No. 6, *birch* is mixed with both above the *deodar* and *Pinus excelsa*. On south side are *silver fir*, *birch* and *raee*. No. 6 contains the best young forest of all sorts; but 1, 2, 7 and 8 show also in places good abundance of young trees.
2.—Nilang "	670	9	1	7	11	12	40		.	6,230	670	4,690	7,370	8,840	28,000	..	...	
3.—Gumgum "	1,084	7	¼	2	5⅓	8½	23¼	4	...	7,588	271	2,168	10,462	13,714	34,203	4.336	...	
4.—Hirsil "	368	2½	2	12	4	4	14	..	...	920	736	552	1,472	1,472	5,152		...	
5.—Tailgari "	1,179	1	½	1	¾	6¼	9½	29	...	1,179	589½	1,179	95	7,399	10,441½	2,14,191	...	
6.—Sarti "	943	4	½	2½	1	11½	19½	17	...	3,772	471½	1,357	947	10.844	18,391½	16,030	...	
7.—Dudu "	3,047	7	1	4½	17	20½	50	3	...	21,329	3,047	13,711	51,799	62,463	1.52,349	9,141	.	
8.—Dinar "	3,198	11	7	7	13	26	64		.	35,178	22,386	22,386	41,574	83,148	2,04,672			
9.—Kidar Ganga "	416	9	1	3¼	67½	21½	41¼	27½	.	3,744	416	1,352	2,702	8,944	17,158	1,040		
Total .	11,490	63½	14¼	37¾	67¾	139¾	333	57½	.	87,545	29,172	53,660	1,27,536	2,13,281½	5,11,194½	2,45.908		

G. F. PEARSON, *Major,*
Conservator of Forests, N. W Provinces.

From the Government of India, P. W. Dept., to Secretary to the Government of the N. W. P. in the P. W. Dept., No. 487F, dated 31st August, 1870.

I am directed to acknowledge the receipt of your docket, No. 303 F, of 7th December last, forwarding a report by the Conservator of Forests on the forests of the Bhagirati Valley, together with a map and survey statement; and in reply to communicate the following observations and orders of the Government of India:—

2. The first report on these forests submitted by Major Pearson in October 1868, which was received with your docket, No. 389F of 9th December 1868, was prepared after a cursory examination of the forests. The present report gives a valuation, the results of the surveys made by Mr. Grant, Assistant Conservator, under the Conservator's instructions. It is a valuable report, being the first attempt at determining the quantity of the growing-stock of timber in the different sub-divisions, of an extensive Forest Division in the North-Western Provinces, and His Excellency the Governor General in Council is glad to observe that Major Pearson has fully appreciated the importance of these investigations.

3. The Bhagirati forests form a portion of the forests leased by the Tehree Rajah, they are, moreover, expected to yield a large proportion of the timber and sleepers required for the Rajputana State Railway; it is therefore most important to know the extent of their timber resources. The area of the forests on the main river is reported to be 11,490 acres, estimated to contain 116,717 first-class trees, of which number, however, more than one-fourth are believed to be unsound. Considering that the forests in the Nilang Valley are not included, the figures of the present survey fully bear out the remark made in Major Pearson's first report that the estimate of 100,000 trees made by Mr. Williams, the Commissioner of the Mirat Division, was below the mark. The large proportion of the trees of 3rd and 4th classes, and the considerable extent of young *deodar* forests reported in several blocks, is very satisfactory.

4. The Conservator does not enter upon an estimate of the quantity of timber that may be cut annually with a due regard to the maintenance of these forests, but from the general tenor of this report, as well as from para. 5 of his letter of 20th August 1869,* it is understood that for the next five years he anticipates no difficulty in supplying the needful quantity of *deodar* timber for the State Railway as far as the Bhagirati forests are concerned, and that this quantity can be removed without risking the maintenance of the forests. A portion of the supply can, it is understood, be obtained from the dry timber in the forests, partly felled and partly killed by Khil cultivation.

* Received with North-West Government Letter, No 59 F-C, dated 4th September 1869.

5. The principles laid down by the Conservator for working these forests, as far as they can be gathered from the report, appear to be sound. They are—

1st.—To utilise the dead trees and felled timber, wherever possible, throughout the forest.

2nd.—To confine fellings to certain limited and well-defined portions of the four western blocks.

3rd.—In the tracts selected for felling, to remove as many of the sound first class trees as can be taken without denuding the ground, or depriving the young trees of shelter, but nowhere to work complete clearances.

4th.—After the work has been completed in any tract, the same to be closed absolutely.

6. The main object to be kept in view, here as elsewhere, should be to ensure a vigorous young growth of *deodar* in those blocks where fellings have been made, while utilising the mature timber to the best advantage.

APPENDIX D.

REPORT ON THE DEODAR FORESTS OF JAUNSAR BAWAR, IN THE NORTH-WEST PROVINCES.

Memo. from COLONEL C. J. HODGSON, R. E., Secy. to the Govt. of the N. W. P., in the P. W. Dept., to the Conservator of Forests, N. W. Provinces, No. 198F, dated 29th June 1869.

Acknowledges the above, and states that the report contains a full, clear, and highly interesting account of the forests in question. It shows that these forests are especially valuable, owing to the rapid growth of the *Deodar* in them.

2. The wants of Chakrata may apparently be supplied in great part from the Bodia forests before all the first-class trees which may be cut without injury to future production are exhausted, and the remainder from the Mushak forests. In the Koti and other forests, it is no doubt necessary for their preservation to exclude cultivation, and the question of doing so should be carefully considered. The destruction of the beautiful *silver fir* forests above Koti should be avoided, if possible, and it may be hoped that it will be rendered unnecessary by securing the complete reserve of the existing *Deodar* forests. The forests about the Dharagad will afford ample stores of timber for the present, and admit of the market being well supplied for the next 10 or 12 years.

3. The trans-Tonse tracts are shown to be highly valuable to the British Government for their forest reserves; and this fact will be communicated to the General department of this Government, in order that it may have its due weight in the determination of the question now pending, as to the proposal to relinquish the British territory on the right bank of the Tonse.

4. As to the measures to be taken for forest conservancy, His Honor the Lieutenant-Governor observes that, in Jaunsar Bawar, the *occupied* portions of the soil are settled in full proprietary right with the village communities. In the remainder, the village communities have only a modified right; the waste and forest lands within their respective boundaries they hold as against all strangers, but not as against Government, the understanding being that Government can appropriate any portion of the same at its discretion, but on condition that a sufficiency of waste-land is allowed for grazing purposes to the village community, who have also a prescriptive right to the use of such wood as is required for domestic purposes. The Conservator has, His Honor believes, correctly stated that the people do not possess the right of disposing of timber to strangers.

5. The classification of forests should be then—

I.—Government forests (*a*) closed.
II.— „ „ (*b*) open.
III.—Village forests.

I.—In order to the formation of a closed forest, it is necessary that the sole right be vested in Government, and that, if there be any other prescriptive rights, they be extinguished by compensation, or otherwise. This, under ordinary circumstances, can be done by the assignment of an area of village or open forest to the several villages, sufficient to provide for their grazing, fuel, or timber requirements, when the remainder may be declared closed and inviolable. The closed portion will then be marked off by permanent land-marks and notification made that all encroachments on the same will be resisted and punished.

6. Something further is, however, wanted by Major Pearson in respect of the Bodia, Koti, and Kiolo forests. These valuable tracts of timber are interspersed with old established villages, which render forest conservancy, in its complete and only effective form, impossible. The Conservator rightly says that such prescriptive settlements can only be removed by compensation, and, under the circumstances, His Honor thinks that this must be done by voluntary bargain and negotiation, which should be conducted through a civil officer of the district. There is no detail as to the number or area of these occupied tracts, nor any estimate of the expenditure that would be required to eliminate the intruders. Until some estimate on these heads be given, it cannot be judged whether the inconvenience and hardship by eviction would be justified and the cost of compensation re-paid by the public advantage anticipated from closing the forests. The subject will be referred for consideration to the General Department of this Government. If an officer of the settlement staff could be spared, it would, in His Honor's opinion, be desirable to depute him to

determine these points in communication with an officer of the Forest Department. Mr. Cornwall is said to be eminently qualified for the duty; but before any determination is come to on this point, a further report will be awaited in the Revenue Department. Meanwhile, it is admitted with the Conservator, that it is extremely desirable to have these valuable forests in distinct and self-contained blocks, each thoroughly cleared of private rights of every kind.

7. II.—The open Government forests would be all other forests which it may not be expedient or possible at present to close. These will be open to grazing and fuel demands as heretofore, but the cutting of timber must be prohibited, except under sanction of the Forest Department, which might take a general form, by declaring certain classes of wood as free to be cut, no other trees being touched but by express permission. There is no occasion to require an annual application for the privilege of grazing; the rights of Government are well understood. These forests should also be distinctly marked off.

8. III.—The remaining forests would be at the disposal of the villagers, with this condition that they are free to cut what is required for domestic uses, but not to sell nor dispose of any timber to strangers.

9. His Honor is of opinion that the above plan, by which the forest tracts defined as Nos. I and II will alone be marked off, is preferable to marking off the entire village forests. It would still be in the power of Government to add to the areas of Nos. I and II for good reasons, on condition that satisfactory provision was made for village requirements.

10. The rules proposed by the Conservator at the close of this report are just, and conformable to the rights and customs of the people; but His Honor considers that Major Pearson is mistaken in expecting that there will be little pressure for cultivating holdings in consequence of the Chakrata Cantonment; on the contrary, His Honor anticipates a large increase, and desires that the Forest Department should make its arrangements in expectation of such pressure.

11. It is noted, with satisfaction, that the temporary cultivation (*kheel*) on the Kiolo hill has been put a stop to for some years. It should continue to be carefully suppressed.

12. The necessity for the construction of roads, slides, &c., for facilitating transport of the produce from the forests cannot be doubted. It will be the business of the Forest officers to carry out these works. Already a small grant has been made for constructing mule-tracks during the present year from the Deoban forests, and it will be the duty of the Conservator, year by year, to bring forward a scheme of operations with this end, and to propose the requisite budget provision. An estimate should be framed as soon as practicable for forming the road described as passing by the Karama peak to the Jako forest.

13. The proposed order in which the forests are to be worked seems to be that required by their present state, and the special arrangements for supply of wood to Chakrata are approved. On receipt of the estimate for the completion of the Simla road as far as the Tonse, which the Conservator has promised to furnish, it will be considered whether the Government of India should be asked to make a grant from the general funds of the State for the benefit of the residents of the Cantonment in facilitating supply of fuel, &c., or whether the cost should be borne by the Forest Department, and eventually recovered in the price of fuel.

No. 199 F.

Endorsed by the Govt. of the N. W. P., in the P. W. Dept.

ORDER.—Ordered, that a copy of Major Pearson's report, with a copy of the foregoing, be forwarded to the Secretary to the Government of India, Public Works Department, for information.

From MAJOR G. F. PEARSON, Conservator of Forests, N. W. Provinces, to the Secretary to the Government of the N. W. P., in the P. W. Dept., No. 211A, dated 12th May 1869.

The two British pergunnahs of Jaunsar Bawar are situated between the Native States under the Simla agency and the Rajah of Garhwal's country, along the lower spurs of the great range which separates the Jumna from the Tonse, and culminates in the peaks above Jamnutri. There is also a small tract west of the Tonse, between the Chachpur ridge and that river, containing some valuable forests, which belong in part to the British Government, and in part to the petty Chief of Taroch. The main features of the country are—1st, the principal back-bone or ridge which runs up from the junction of the two rivers in a N. N. E. direction to Deoban, and thence on to the Jako pass, after which, following the course of the Tonse, it bends more to the eastward, and is lost in the high peaks of Banderpauch; and 2nd, the spurs which run down on either side of it to the two rivers. The western spurs, which run down to the Tonse from the ridge as far as the Jako pass, mainly contain the forests which it is now proposed to describe. A sketch

map is appended for the better understanding of the report. Dr. Brandis himself made an inspection of some of these forests in 1863, and I am indebted to his report for much useful information regarding them.

2. The principal *Deodar* forests in Jaunsar Bawar are as follows:—

On the Lokandi spur	I.—The Bodia Forest. II.— „ Mushak „ III.— „ Koti „
On the spur between the Binargad and Chiligad	IV.— „ Kiolo „
Round the head of the Daragad ...	V.— „ Tatwa „ VI.— „ Lakwa „ VII.— „ Jako „
On the Chijal spur	VIII.— „ Chijal „ IX.— „ Koti and Bastil Forest.
West of the Tonse	X.— „ Mandhol.

Besides which, large forests of *oak, firs,* and scattered patches of *Deodar,* fringe all the ridges and clothe the sides both of the main range and of the lateral spurs, which will be described in due order.

CHAPTER I.

DESCRIPTION OF THE FORESTS.

Forests of the Dioband Hill.

3. The Dioband Hill is a prominent feature of the main range. The forests are important, as being situated close to the new cantonment of Chakrata, and from them the main supply of fuel and common building timber must be drawn. Only a few patches of *Deodar* are found on the hill itself, chiefly scattered on the north-west side; but the south and east faces are well clothed with *oak,* chiefly *bânj* with *moroo,* which will need careful protection; and on the top of the hill there is a magnificent forest of *kurzú oaks.* Below this, but near the summit, on the spurs which run down from the north-west and west flank, the *spruce fir* is found in great abundance mixed with *silver fir,* which both show fair development. These forests, with proper care, should go far to supply the ordinary wants of the new Cantonments, and the arrangements which have been made for this end will be detailed in the proper place in this report.

Forests on the Lakundi Spur.

I.—The Bodia Forest.

4. This is a beautiul forest of nearly pure *Deodar,* close by Lokandi Ghât, about 8 miles nearly due west from Deoban, and only about four miles directly above the Tonse. It is situated in a compact basin or valley, like a horse-shoe, on the south-west end of the main pur. The northern semi-circle is, properly speaking, known as Kanani, but, with a view to simplicity of nomenclature, I propose to call it all Bodia.

5. The basin or valley, in horizontal area, may perhaps be about two miles in width by one in depth, but the numerous ravines and spurs which run down from the main ridge must give a much larger superficial area of forest. The rocks are limestone, and very precipitous, and the ravines are full of a rich deposit of decayed vegetable matter, in which the *Deodar* seems to spring up with great vigor wherever it has a chance, and thousands upon thousands of young seedlings may be seen coming up, literally as thick as corn in a field. But, except in a few places where chance favors them, the seedlings are never permitted to come to maturity, as many hundreds of sheep from the neighbouring villages come to graze here, and, by nibbling off the heads of young shoots, have reduced them to the condition of furze bushes. But the natural growth of the *Deodar* in this well protected basin is wonderful, and Dr. Brandis, who made several surveys here, gives about 70 years as the average age of a first-class tree

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Note.—In this report the *oaks* and *firs* will be called by their common English or Native names, as being more generally understood, the botanical names of the principal trees being as follows:—

Oak	*Bânj*	*Quercus incana.*
„	*Moru*	„ *dilatat.*
„	*Kurzu*	„ *semicarpifolia.*
„	*Tilouge* or *Bani*	„ *annulata.*
Silver Fir	*Marinda*	*Picea Webbiana.*
Spruce „	*Ral*	*Abies Smithiana.*
Chil	... ...	*Pinus excelsa*
Chir	. .	„ *longifolia.*
Cyprus	... ...	*Cupressus torulosa.*
Deodar	... ...	*Cedrus deodara.*
Maple	.. ...	*Acer*

which is certainly not too little, as I have counted myself many stumps, 2 feet in diameter, which show an age of only from 50 to 60 years.

6. From this forest all the trees for the Chakrata barracks have been taken. Up to the present time about 1,400 trees above 6 feet in girth have been felled, and about 400 more, which have been withered, but not killed by girdling, which was altogether a mistake, remain to come down. With due regard to selection, this number would not have been too great for the forest to spare; and though it is not possible to see the present condition of the forest without regret, yet, where harm has been done, it is chiefly from taking trees from such places as had evidently been pretty well worked previous to the forest coming into Government charge. I have no reason, however, to think that, when the forest can be finally closed after the present operations are completed, it will not thoroughly recover itself. As long as the work is going on, and some hundred sawyers and coolies are encamped in and about the forest, it is impossible to do anything in the way of clearing it up and putting things to rights, and I must confess that at present its appearance is extremely piteous.

7. There are a great number of regularly-terraced fields belonging to the village of Loharee, scattered in the ravines of this forest. I shall make a vigorous effort to obtain possession of these by compensation or purchase, as, if the forest were once in sole possession of the department, I am sure, with a little aid in the way of sowing seed, the whole basin might be filled with such a forest of *Deodars* as perhaps the whole of the Himalayas could not show.

II.—The Mashak Forest.

8. Mushak is situated on the north or opposite side of the main Lokandi spur to Bodia. The ridge itself on that side is tolerably covered with scattered patches of *Deodar*, intermingled with *cypress* on the higher ridges, and *firs*, chiefly *spruce* (mixed with some *silver firs* and *chil*) lower down. There are also *oaks* and *rhododendrons*. Around the village of Mashak itself, there has no doubt been formerly a considerable *Deodar* forest, but its contents have been largely cut down in past years and sold for a trifling sum to the villagers, who come up for the wood from below. In no place can there be said to be a regular forest like Bodia. Eastward, towards Dioband, the forests get thicker, and numerous patches of *Deodar* are found among the *firs* and *oaks*. All along, however, the *spruce fir* predominates and forms the staple portion of the forest. I purpose, after the Bodia timber is worked up, that the supplementary requirements of the Chakrata barracks be met from here. The trees will be carefully selected wherever they are available, a sufficient number being left in each patch or block for the purposes of seed. Were it possible, with regard to the wants of the numerous villages below in the valley, the whole of the north face of the spur above Mushak should be made a close reserved forest; but I fear the necessities of providing some grazing ground for their sheep will prevent this being done. As the scarps in many places are exceedingly precipitous, the working of the forest, except along a certain line, would be difficult and expensive, so perhaps this is less to be regretted.

III.—The Koti Forest.

9. On the northern side of the main Lokandi spur, there is a most lovely little forest, the nucleus of which is round a temple in a beautiful glen, about half-way between Lokandi Ghât and Deoban, overlooking one of the feeders of the Benargad. The growth of *Deodar* is here perfectly extraordinary, and in two of the old stumps, which were of huge size, though imperfect, the rings showed that trees in the 21 years of their life had attained a diameter of timber of 12 and 13 inches, respectively. In one case, five regularly-formed consecutive rings measured *each* two-fifths of an inch in depth, five rings giving a radius of 2 inches. The whole of the little valley and hill above it must have been formerly an exquisite forest of pure *Deodar*, but now fields have been cut in the forest in every direction, and the trees stand in bands or patches amongst the fields, stretching somewhat more compactly above them for a considerable distance. There are still probably a couple of thousand well-grown trees scattered about; and, as the growth of the younger trees is remarkably prolific, and the beautifully straight development of their stems even in Jaunsar is remarkable, efforts must be made to obtain possession of at least some compact blocks of the forest; for I am sure that, if the terraces were only ploughed up and strewn with *Deodar* seed, the whole hillside would, in a few years, be covered with a mass of magnificent young forest.

10. Immediately above the *Deodar* at Koti, there is one of the finest and most noble forests of *silver fir* and *spruce* that I have seen anywhere. The side of the limestone hill, covered with a rich vegetable deposit, is somewhat steep; the trees are all giants, and the forest underneath them being perfectly clear and free from undergrowth, presents a very noble appearance. I noticed in a few places some young *Deodars* (of which a very few old trees are mixed with the *firs*) springing up under the shade of the *silver firs*, to the supercession apparently of the proper offspring of the latter. This led me to think whether it might be possible, with regard to the singularly favorable conditions of this locality for the growth of timber trees, to supplant the *fir* forest by a more valuable one of *Deodar*, killing the former by girdling them *by degrees* (for it would never pay to remove them as timber)

so as to make room for the latter. It would be a sin to spoil so noble a forest, were it not that I do not well see how to get possession of very much of the cultivated portion of the forest below them.

IV.—The Kiolo Forest.

11. Returning to Deoban, and following the main ridge northwards to the Karama Peak, *deodar* is found scattered here and there, sometimes in considerable quantities, especially on the west side of the range, and in the *khuds*, which are very precipitous, running down into the head streams of the Bannargad. After running for about 6 miles along the east side of the ridge, a steep path leads down through a forest of *oaks* and *maple*, with some *firs*, to a spur of the Karama Peak, running down between the affluents of the Pennargad and Chilligad. On this spur is situated the village of Kanin, and around and above it, is the fine *deodar* forest known as Kiolo.

12. Along the main range leading down to this spur, and on the grassy slopes which run up to the Karama Peak from its base, some exceedingly noble *deodar* trees are to be seen—trees measuring 15, 16, and even 17 feet in girth, and of proportionate height being continually met with. These stand in clumps of five or six (more or less) in number, for the most part on little spurs or other places where a deeper deposit of earth remains than the steep slope of the hill side usually admits of. Indeed, for the whole distance down to the village of Kanin, little else but *deodar* is to be seen, mixed with some *cheel*. But here, as at Koti, the village is almost in the midst of the *deodar* forest, and, except in a few favored places, cultivation and grazing have so usurped the place of the forest that no young trees are to be seen coming up anywhere. Indeed, every inch of ground that is spared from the plough is burned for the sake of the sheep grazing. The forest covers the summit as well as both sides of the spur, the main portion of it, however, being on the northern slope, the whole of which, as well as a portion of the summit, I trust it may be possible, without interfering with village rights, to obtain possession of as a close reserve.

13. I estimated that above and around Kanin, included the slopes up to the Karama Peak, there were altogether between 3,000 and 4,000 first class *deodar* trees, with about a like number of second class trees; but anything like a proper proportion of younger trees was altogether wanting. I should mention that terrible destruction has been committed here for temporary cultivation (called here *khil*), similar to the dhyas and bendries of Central India—and several hundred dead *deodar* trunks now disfigure the Kiolo Hill. This wanton destruction has been entirely stopped during the last three or four years.

V and VI.—Totwa and Lokwa Forests.

14. Crossing the Chilligad stream, and ascending by a very steep path, the next main spur, which separates the Dharagad valley from that of the Chilligad, and the pergunnah of Jaunsar from Bawar, the forests at the head of the Dharagad, known by the names of Totwa and Lokwa, are entered. These are by far the finest, most extensive and most perfect of all the *deodar* forests in this district. I should estimate the distance from the village of Lokwa, which is situated low down on the northern face of this spur, nearly opposite Chejal, round through the Totwa forest, and over the village of Lokhar to the Jako Pass, as not less than 8 miles, taking the ridge. But as in this distance there are eight main *khuds* or ravines, some of which have a depth of at least 2 miles, I cannot estimate the superficial area of forest contained in this space at less than 16 miles in length by 1 in depth. Taking the rates given in Dr. Brandis' survey (No. 15 of 12th June), *viz.*, 1,083 for first class, and 767 for second class trees per acre, this would give about 10,000 first class *deodars*, and 7,000 second class trees for these forests; but as his calculations were made on the Totwa forest, which has been very heavily worked, whereas Lokwa, which covers full two-thirds of the area, has hardly been touched at all, I myself think that for the whole forest, the number of first class trees might be doubled, and the second class raised by trebling them, making the numbers 20,000 and 21,000 respectively. But, except an accurate survey of the ground be obtainable, it is impossible to do more than make a guess, as even when the average number of trees per acre is known with tolerable correctness, it is very difficult to apply the figures to the total area, so as to get satisfactory results. In one *khud* alone, in Lokan, I counted altogether in one spot, in about 4 acres, between 200 and 250 (it is most difficult to count with exactness in such a place), all being first class trees of 6 feet in girth or thereabouts, and upwards, and none of them under 100 feet in height, while many must have approached 200 feet. On the trees there was not a single branch for 50 feet from the ground; all by growing close together had cleared each other, and showed perfectly straight boles and clean timber. The rocks here are still limestone, covered with a rich vegetable deposit, and the sides of the *khuds* are very steep, and very hard work it is walking over them. The whole of this forest should be secured as a first class reserved forest. Some of the *khuds* are pure *deodar*; in others *deodar* is mixed with *silver fir* in large proportion, with some *spruce*; while in others again hardly any *deodar* is found, but nevertheless *deodar* is the main standard tree of the forest.

15. The upper portion of the Totwa forest extends well down into the *khuds* and ravines on the east side of the main range, and down the head of the stream known as the Riknalgad. Passing along the upper ridge, the trees are magnificent in appearance and size, and many of them are very old, with pleasant grassy slopes below them. These trees naturally attracted Dr.

Brandis' attention, and he measured two of 11 feet in girth, and 115 and 135 feet in height respectively. There are many nearly as fine, but I am not sure that the average rate of growth in these forests is so rapid as in the forests of Bodia or Kiolo, though some stumps show fair results. The trees that I counted averaged about 8 rings to 1 inch of radius, which agrees closely with Dr. Brandis' higher figure of 98 years for a first class tree. In the Bodia forest, as shown before, an average of 5 rings to every inch of radius is by no means uncommon. There is a great absence of young trees all along the ridge, and on the grassy slopes below them, as they have no chance with fires, and sheep. In portions of the Lokwa forest, however, the growth of young trees and saplings is magnificent.

VII.—The Jako Forest.

16. West of the Jako Pass there is a high mountain in the deep bay, on which there is a pure *deodar* forest of considerable extent. From the steepness of the sides of the hill the trees are not as large as others, but it seemed to me that the timber was exceedingly firm and well-grown, and if it could be got down would be valuable. There is a magnificent view down the Rám Serai Valley to the Jumna, and across the high ridges to Banderpauch, from the summit of this mountain. There is also an excellent view of the forests of Lokwa and Totwa on the opposite side of the valley.

VII.—The Chijal Forest.

17. Descending this ridge, we come upon the Chijal spur, which, after dividing into two minor spurs, runs down into the Tonse, near its junction with the Pabar. Above Chijal there has been a fine *deodar* forest, but it has been horribly mutilated for *khil* cultivation, and there are about 2,000 dead trees killed by fire now standing on the hill-side. Still there is a very considerable amount of good forest left, and much of the space that was cleared is again clothing itself with young *deodars;* a little care would enable it to do so entirely; and this, I propose, to have taken, as well as to make some endeavour to utilise the timber of the dead trees, which is still sound, by converting them into planks, and floating them down the Tonse. This work must, however, perhaps stand over for the present. I should calculate that there are at least 3,000 first class trees (living) left in the Chijal forest.

18. Proceeding down the ridge towards the Tonse, we find that it separates itself into two minor spurs, on one of which is situated the village of Koti, and on the other that of Bastil. The latter is the residence of the Wazir of Bawar, and hereditary high priest of the Únale temple on the Tonse. These spurs possess two small but perfect forests of *deodar*, mixed in the upper portion with a good deal of exceedingly fine *cheel (excelsa)*. These are numbered IX in the list. The growth of timber in the Bastil forest is said by Dr. Brandis to be very satisfactory. I did not myself note it, but in that of Koti, where we get on to a shaly soil—though the forest, from being a temple one, is excellently preserved—the growth is very slow indeed, and few of the trees are above 5 feet in girth. This is no doubt owing to the fact that the trees stand too close together, and have hindered each other in their growth, as well as to the greater poverty of the soil. Still, nearly all of them are now useful timber trees, and I do not think they will grow much bigger, as they are all evidently considerably more than 100 years old. The forest is about 150 acres in extent, and may contain about 2,500 or 3,000 trees, all much of the same size. On the Bastil side, there may be, perhaps, 2,000 available trees, but I had not time to examine the forest critically.

19. To recapitulate them, after deducting Bodia, which may be considered as worked out, I should estimate the contents of the Jaunsar Bawar forests nearly as follows:—

	1st Class.	2nd Class.
I.—Bodia		
II.—Mashak	1,500	1,000
III.—Koti	1,500	1,000
IV.—Kiolo	3,000	3,500
V.—Lokwa	20,000	21,000
VI.—Totwa		
VII.—Jako	2,500	3,000
VIII.—Chijal	2,500	2,500
IX.—Koti and Bastil	3,000	5,000
Total ...	34,000	37,000

This may, I think, be taken as a moderate estimate, as Dr. Brandis estimated 40,000 first-class trees; but he had not the same opportunity for a critical examination as I had, and in the absence of any certain statistics, I would prefer to be rather under than over the mark. There is no doubt that the whole country is most prolific of *Deodar*, and if it were possible to carry out conservation thoroughly everywhere, it might be converted into one vast *Deodar* forest.

20. Crossing the Tonse by the Julur on the Simla road below Koti, and ascending to Mandhol in the larger ravine above the bungalow, stretching up to the Byrach peak, there is a magnificent *Deodar* forest, nearly pure, but mixed partly with *silver fir*. It contains many noble trees, some of them measuring from 15 to 16 feet in girth, and covers an area of full two miles in the *khud* and on the mountain-side. It is also, as regards the

natural reproduction of young *Deodar*, one of the very first in value of all the Tonse forests. In addition to this, the lower portion of the same *khud* (the Chandnigad) is lined with a noble *chir* forest, which extends in profusion up the Pabar as far as Sansog, a distance of some 20 miles. It is altogether one of the finest *chir* forests I have seen in the Himalayas, though some portions of it have been sadly mutilated by the operations of Soda Sing, a railway sleeper contractor, who seems to have made no attempt to remove his timber, but has left it to rot, partly in the river, and partly where it was cut. He probably failed in his attempts to float out the logs, as much from ill-devised and ill-timed operations as from any inherent hindrance to floating in the river itself, which at full floods must certainly contain water enough to carry down sleeper logs, if aided by gangs of men to push them off when stuck on the rocks. Probably, however, for economy in saving labor of this sort, it would be preferable to cut sleepers up in the forest, if the Pabar *chir* ever be used for that purpose. The question as to whether these forests are to be retained or given up to Taroch Raja is now before Government. It will be a very great loss of most valuable property if they are allowed to pass from us.

21. I have not this year had time to explore the *Deodar* forests up the Pabar and to the head of the Tonse, or those in the Jumna valley and in the vallies which drain into it. From Sansog, however, I could see two fine *Deodar* forests south of the Rigangarh, on the east side of the Pabar, with a temple near them, in one of which there were some stupendous trees. About 30 or 40 miles off the Tonse, near Datmir, there is, I believe, a considerable amount of *Deodar*, quite workable. Again, near Shalna on the Jumna, and Banal on the same river, and in the Rámserai valley, on the east side of the Jako pass, *Deodar* is certainly to be found in workable places; but I have not yet had time to examine them.

CHAPTER II.

Proposed future arrangements for the management of the Jaunsar Forests.

22. These may be divided into the following:—

1*st*.—Arrangements for getting possession of, and marking off, the best forests as reserves, and for their conservancy.

2*nd*.—Arrangements for making them accessible, and getting the timber to market.

3*rd*.—Arrangements for a working plan for the forests.

4*th*.—Special arrangements for the conservancy of the Deoban hill and supply of timber to Chakrata.

5*th*.—Arrangements for providing for the wants of the people in wood.

1*st*.—*As regards marking off the Reserved Forests*.—It is quite true that the State rights in the forests of Jaunsar Bawur have been, with certain exceptions, reserved to Government in the "record of rights" of the settlement, but as this record contains a proviso "that wood is to be allowed to the people, and grazing for their sheep and cattle," the difficulty is not entirely got over; because, as long as the people can take wood, or graze their cattle where they please, there can be no forest conservancy, and matters will practically remain as they are. Moreover, even if no proviso existed in the settlement paper, it would be necessary to provide for them as being general requirements of the community.

23. It may be admitted that the right to grazing and wood does not concede that this right can be exercised *wherever the people please*, though heretofore such has been practically the case. There will be no difficulty regarding the wood, but as sheep exist in large numbers throughout both pergunnahs, and as in their grazing their natural habit leads them to wander over large tracts of country, while it is no easy task to exclude them from any place where they wish, or have been accustomed to go, I am afraid we shall not have such an easy task with them. Any one who knows the difficulties that we have experienced from sheep breaking loose on the Welsh and Scotch mountains, will appreciate this. Keeping, then, in view these difficulties, I propose to meet the requirements of the forests, and at the same time of the people, by much the same plan as was pursued in the Central Provinces, *viz.*, by forming three descriptions of forests:—

I.—The reserved or State forests.
II.—The village forests.
III.—Open forests belonging to the State.

The first class should be absolutely close forests, in which the right of felling all trees will rest absolutely with the Forest Department, and in which all grazing must be absolutely prohibited, and the firing of the grass prevented. Only the best *Deodar* forests should be included in this class.

24. In the second class, every village should have a tract of waste and jungle set apart for its own use in proportion to its wants, in which the people should do exactly as they like, except that they should not be allowed to cut *Deodar* or other reserved trees without permission (though the trees included in it would belong to themselves), and from which they should not be allowed to sell any wood at all. This last provision is necessary to prevent their turning their wood into money, and then coming to us for more,

25. All the rest of the forest and waste should be included in the third class. In these third-class forests the Government rights *should be reserved, but not enforced,* except where it might for special reasons be considered necessary to do so. In these forests the sheep must find grazing, and in my opinion no payment could be taken under the settlement rights for it from the people; but I think permission should be asked by them yearly for the privilege to graze, in order to show that the Government retains the right to withdraw or withhold it. This might be advisable in case it were necessary to take up land from these for first class forest reserves hereafter. In addition to this, it would be in the power of the Forest Department to allow certain trees of inferior value to be cut without permission in these forests.

26. But it will be seen from the preceding chapter that, in several of the best *deodar* forests (especially in Bodia, Koti, and Kiolo), a large amount of regular cultivation exists in the forests. This cannot in any way be compared to the temporary clearances known as *khil,* nor does the case here in any way resemble that of little villages which have been allowed to remain unreserved in certain parts of the Kamaon forests, and in some of the Central Provinces' forests, with manifest advantage; for, in Jaunsar, large sums of money as well as much labor must have been expended on the terraces, which are regularly cultivated every year, and it was clearly the right of the people under the settlement to make those fields, whereas the people themselves live outside of what it is proposed to make the forest limits in their own villages; and yet (specially in Bodia) it would be most desirable to get these terraces into our possession, as the holding of fields in the centre of forests by the villages is open to every possible objection, and, in fact, would render proper conservancy impossible. The only plan that I see for getting rid of them is by a money compensation. It has been proposed to make fields for the people elsewhere, but no doubt, in making them in the forest, the people have made the fields in the best place they could find. But as Chakrata becomes a large station, the people round the Deoban hill will cultivate less land, and do much more by earning money in other ways, and purchasing their food. As some of the most favorable *Deodar* localities are cut up in this way, and it is most advisable to get entire possession of them, I recommend this as the only feasible plan.

27. But the whole of the above arrangements must be carried out in connection with the civil officers, and cannot be arranged by the forest officers alone. This is necessary in order that the people should feel that full justice is done them, and that they have, in fact, some one to speak on their side. Moreover, it will require much discrimination and care to carry out the arrangements fairly, inasmuch as, in forming the State forests of the first class, some villages will practically suffer very much, while others will not be affected at all, especially in the matter of grazing, and great care must be taken that this is made up to them elsewhere. When the boundaries of the State and village forests are decided, they should be marked off by permanent pillars at once, and the observance of the boundaries duly enforced. Of course, whatever did not belong to one or the other class would be an "open State forest" of the third class.

28. *2nd.—As regards making the forests accessible.*—Dr. Brandis, at the end of his report, remarks—"The transport of the timber to a place of sale without undue expense is the great difficulty, as all the more valuable forests are situated at a considerable distance from the river. If this difficulty can be overcome, and if the unrestricted and wasteful cutting of *Deodar* by the inhabitants and by parties from the lower parts of the district can be prevented, these forests will prove of great importance, on account of the good size and the rapid growth of the timber produced in them."

29. In these words the real question as to the management of the Jaunsar Bawar forests lies; for at present, not only the forests, but the country itself, is totally inaccessible; for except along the old Simla Road a pony cannot travel anywhere, and a great deal of unnecessary time and labor is unavoidably expended in getting from place to place. There can be no doubt as to the extreme value of the forests if the timber can be got to market at a reasonable cost. In the Bhagirati forests it takes 86 years for a 2nd class tree to become 1st class, according to Dr. Brandis, while in Jaunsar it takes from 16 to 19 years and my own observations entirely coincide with this.

30. I should recommend, then, that a system of roads be commenced in Jaunsar, to be at first merely mule or pony tracks, which might be widened and improved as it became necessary to work certain forests. This will cost a considerable sum of money, and cannot be the work of one or two years, but must extend over several; but when it is seen how much has been done in this way in the Kamaon and Garhwal forests to make them accessible, there is no fear that the same cannot with proper management be accomplished here. These tracks should be made with a view eventually of being turned into graded roads, along which timber trucks could travel, but first regular grades must not be thougbt of. One truck along the ridge, from Deoban by the Karama Peak to the Jako Pass, with branches down the Lokandi spur, the Kanin spur, and the Dharagad to the Tonse, must be the main lines and be first commenced on. These are absolutely required to enable the Forest Officers to get about the country, as at present much valuable time is lost in crossing these trackless *khuds* and spurs. As the forests are worked, branch lines and slides down the hill sides must be constructed to meet them, for it must be made a cardinal principle that the timber be moved *down to the river, and not upwards across the hill,* with the sole exception of the

wood required for Chakrata, which will be provided for separately. The next thing will be to get a boom across the Tonse, or probably across the Jumna, below its junction with that river; but for this we must wait till we gain experience from our Ganges boom. It may be added, that when the country is opened up by roads, the condition of the people will greatly improve in all respects, and it is to be hoped the District Inspector of Schools will make an inroad into the country, for the villages are full of children, but not one in the whole pergunnahs can read or write a word, for there is not a single school in the hills beyond Deobund; and yet, as a rule, the children are exceedingly sharp and intelligent, and ready to converse, and are not at all *gauche* or shy. Next year I propose, with the approval of Government, to enter a considerable sum in the Forest Budget for roads in Jaunsar.

31. *3rd.—As to a working plan for the forests,* it will be seen that Bodia has been worked out to the greatest possible extent for Chakrata, and that still timber is required for the barracks. This I purpose taking from the scattered *deodar* patches in the Mashak forest, on the north side of the Lokandi spur, as being the nearest to Chakrata, and therefore the least expensive to convey there. As all the wood has to be carried up hill on men's backs to Chakrata, this is a point for serious consideration. The Kiolo and Koti forests I should be inclined for the most part to leave alone, if we get possession of them, and *not to fell any tree until it is seen that the bare places begin to be well covered with young saplings.* It is in the forests at the head of the Dharagad that work must commence, and I think that here (if Dr. Brandis' and my own calculations be correct, and a road for timber be made down the Dharagad to the Tonse), that about 2,000 trees per annum might be safely felled for the next 10 or 12 years. By that time the first-named forests, as well as Bodia, would be recovering, and 4 or 5 years' felling might be found in them; by which time the Dharagad forests would be ready with a second crop. In all cases, however, the noble trees which stand along the ridges must be carefully spared.

32. *4th. As regards special arrangements for Chakrata,* the Deoban forests are chiefly valuable from their proximity to the new Cantonment. It is believed that, with proper arrangements, the supply of fuel and ordinary building wood may suffice for the wants of the new Cantonment; but no care must be spared to economise the available resources of the forests, and by opening out roads and mule tracks to bring into use the wood on the more distant ridges, while that in the immediate neighbourhood of the Cantonment is protected. To this end, the Simla Road, which runs along the south side of the Deoban Hill should be completed as soon as possible, as far as the Lokandi Ghat, or even to the Tonse, when mule tracks can be opened by the Forest Department from the various ridges to join it. Tracks must also be cut round the north side of the same hill by Koti, and so along the ridge to Chakrata, so as to open all the forests on the other side of it.

The line works of the Public Works Department have been removed further off Cantonments than they were at first, that the ravines nearest to the station may be made available, under proper restrictions, for residents to obtain their fuel from. As far as possible, every endeavour has been made to provide for the convenience of the Cantonment and its residents, while the natural beauty of the hills and ravines will not be destroyed by the removal of all the trees on them. I believe that the requirements of the new station will necessitate that the Deoban Hill be made a 3rd class forest, in which grazing will be permitted, but where wood cannot be cut except under proper restrictions.

33. *5th.—Arrangements for providing for the wants of the people for wood.*—Until the last few years, the people, both of the hills and the neighbouring country below, have been in the habit of cutting and carrying away *deodar,* and whatever wood they pleased, to a very large extent, and some of the forests—like Totwa and Mashak—have been very heavily worked for this purpose, to the great profit of the neighbouring zemindars. Those who came from below, however, had to pay something (though it was a trifle), to the head-man of the village, on whose lands they cut the wood. By the terms of the settlement, the people of Jaunsar Bawar *are clearly entitled to wood according to their wants,* but nothing is said about its being *deodar.* They will declare that they cannot use any other, but the same was said of *teak* in the Central Provinces; and the people have managed very well there without *teak,* since they have not been able to get it. I propose then—

1st.—That all people who have *deodar* in their village forests should of course get it, and that it should be given gratis also *for their own wants* to those who formerly had it in their forests, but from whom the forests have been taken away to form State reserves.

2nd.—That those who neither have *deodar* in their forests, nor ever had any, must use other wood, such as *fir* or *oak,* which they may have gratis; but if they require *deodar,* they must pay for it at the rate of one-fourth the average selling price of *deodar* in the Division. This was the rule in the Central Provinces with regard to *teak,* and worked well, as it checked its being used except when absolutely required.

3rd.—Artisans and timber-dealers of all sorts must pay the full price for *deodar.*

4th.—But no villager in Jaunsar must sell wood of any sort without distinct permission from the Forest Officer, even though it be from his own village forest.

From the Government of India, P. W. Dept., to Secy. to the Government of the N. W. P., in the P. W. Dept., No. 291F, dated 6th June 1870.

I am directed to acknowledge the receipt of your docket, No. 199 F, dated 29th June 1869, forwarding a report by the Conservator of Forests on the Deodar forests of Jaunsar Bawar.

2. This interesting report is accompanied by a careful review by His Honor the Lieutenant-Governor, for which I am directed to express the thanks of the Governor General in Council.

3. It is observed that it is proposed to constitute two classes of forests—1, Government forests; 2, Village forests. The Government forests are again to be divided into open and closed forests, both of which are to be demarcated. I am directed to request that the progress in the work of demarcating these important forests should, from time to time, be reported for the information of the Government of India.

4. It is also observed, from para. 20 of the report, and para. 3 of the review thereon, that it is proposed to relinquish a portion of British territory on the right bank of the Tonse river containing the Mandhol forest. I am directed to request, that when the question has been settled, this department may be furnished, for record, with information respecting the boundary line of this forest district, and a map should be submitted showing the limits of British territory on the right bank of the Tonse, near its confluence with the Pabar.

APPENDIX E.

REPORT ON THE DEODAR FORESTS AT THE HEAD OF THE JUMNA AND TONSE RIVERS IN THE N. W. PROVINCES.

Memo. from COLONEL C. J. HODGSON, R. E., Secretary to the Government of the N. W Provinces, in the Public Works Department, to the Conservator of Forests N. W. Provinces, No. 337, dated 31st December 1869.

Acknowledges Conservator's report, with map, on the above-noted forests, and observes that the condition and prospects of these forests is shown to be highly satisfactory.

2. Approves of the proposed removal of the sleeper operations from the Jaunsar forests to those of the Tonse, as well as the proposals for future operations. An estimate should be sent up of the expenditure desired to be incurred in making a path up the Tonse, including the wire-rope bridges said to be required.

3. With reference to the question of using creosoted *chir* sleepers, observes that His Honor is not aware that the method now employed for impregnating timber is not effective, or that there is reason to suppose that *chir*, so treated, will not produce durable sleepers; and if this be the case, it would seem to be desirable, as an unlimited supply of this kind of timber is so easily procurable, to at once establish creosoting works at some convenient point. The proper place at which to carry out this operation for the Rajputana Railway would seem to be Dehli, to which sleepers cut up at the forest depôts could be floated down the Jumna, or down one or other of the Jumna canals, and, after impregnation, be boated down to Agra. If Conservator, however, has any information or suggestion to offer on this point, he is requested to submit it.

4. With reference to Conservator's proposal to grant a small allowance to the *Padhan* of the village, to whom the care of the small *Deodar* forest above Shalna is intrusted, intimates that the Lieutenant-Governor concurs in the recommendation of the Conservator, and desires that a definite proposal on the subject may be submitted.

5. Conveys the acknowledgments of Government to the Conservator for the report submitted by him, which is most interesting, and appears to be, so far as Conservator's opportunities of observation went, complete and comprehensive for the part of the country described. The report and map will be published in the Selections of this Government, and copies sent to the Government of India.

No. 338 F.

Endorsed by the Govt. of the N. W. P. in the P. W. Dept.

Copy, with copy of report, to Secretary to Government of India, Public Works Department, for information.

From MAJOR G. F. PEARSON, Conservator of Forests, N. W. Provinces, to the Secretary to the Government of the N. W. Provinces, in the Public Works Department, No. 248 A, dated 5th December 1869.

I have now the honor to lay before you, for the information of His Honor the Lieutenant-Governor, some account of the *Deodar* localities, not previously described, which lie about the head of the Jumna and Tonse rivers. A rough sketch-map is appended, and, by a comparison of it with the atlas-sheet, their position will at once be seen.

2. It will be seen that three main ridges spring out of the block of snowy mountains, of which Banderpauch is the main feature. The first of these separates the Ganges from the Jumna, of which the last distinctive feature is Nagtiba, opposite Masúri; the second range separates the Jumna from the Tonse, and may be said to extend as far as the Deoban; and the third separates the Tonse from the Pabar, and, indeed, is a branch of the main range which divides the Satlaj from the group of rivers south of it. All these ranges are well covered with fine forests of *firs* and *oak*, but the Ganges and Jumna range is only *Deodar* bearing in a few special localities; the Jumna and Tonse range only becomes so about its

lower extremity near Deoban, where it contains the Jaunsar Bawar forests (already described); but the last, or Tonse and Pabar range, seems to have *Deodar* as its characteristic tree from the point where vegetation commences below the snow-line. I shall now proceed to describe the *Deodar* localities on these ridges in detail.

3. Commencing from the Ganges, there has been a considerable forest (No. 1) above Barahat, near Salda, but it was well worked by Mr. Wilson in former years, and latterly about 1,000 trees, it is said, were cut down shortly before I took charge of the department. It is now cleared out entirely, except a few young trees which are coming up in places. Near Lisnor (Uprikot), there are two small forests (No. 2), but these are probably too remote from the river to be of any use, except for the villagers. About 400 trees were felled three years ago in the lower forest near Kauna, but they are five koss from the Ganges, and it would be impossible to remove the sleepers without doing something to improve the road down to the river. It is doubtful, as there is so little timber available, if sleepers sawed up here would bear this charge in addition to the cost of carrying them to the river; but the subject shall receive my attention, and, if possible, this timber shall not be wasted.

4. The range above Uprikot contains one of the finest *oak* (*morú*) forests which I have seen in the hills. Descending into the valley of the Jumna, there is a small *Deodar* forest above Shalna. It covers about 250 or 300 acres, and being on a moderately-sloping hill side with a southern aspect, the growth of the trees is exceedingly favorable, and the young trees numerous. Portions of the forest have been much injured by fire in former years, and the greater portion of mature timber has been felled by the people of the country for house-building, perhaps 1,000 trees may remain fit for timber at the present time. The growth of timber here is fully equal to the best specimens in Jaunsar. The care of the forest is entrusted to the *Padhan* of the village, who says he every year takes some precautions against fire. It would be better to make him some small allowance and hold him practically responsible.

5. South of this there are some small patches of *Deodar*, about the Bonk peak and Nagtiba hills, but they are either too far away and too small to be of any practical importance, or else they had better be reserved for the special wants of Masúri. Mr. Scott, of Masúri, removed a good quantity of *Deodar* from this part of the range in past years.

6. As regards the capabilities of the Jumna as a floating river, from all that I can learn, it is quite free from impediments, except for about two miles near Singon, about 20 miles due east of Chakrata, where some not very heavy rocks are found in its bed. The river, however, shall be specially examined and surveyed (if possible) during the present cold season.

7. Crossing the Jumna on to the Kidarkanta ridge, which separates that river from the Tonse, there is (or rather has been) a very fine *Deodar* forest in the Bánál, a tributary of the Jumna, which joins it just above Barkot. This forest (No. 4) extends along the left bank of the Banál for about two miles, and may on an average be half a mile in depth. This forest contained much fine timber in former years, and many very fine trees still remain in it. The growth is quite remarkable, and I have never seen it equalled elsewhere, one stump of nearly 8 feet girth showing only a growth of fifty-six years, the rings being perfectly even. But it being situated in the middle of a thickly-populated country where there is but little *Deodar*, it has been terribly cut up by the people for house-building purposes, and there are not, perhaps, more than 2,500 or 3,000 available timber trees at present in the forest. In some places the trees have been cut down as clean as if they had been mowed, but the growth of young *Deodar* since the very moderate protection that the forest now receives, is quite remarkable.

8. There are some small patches (No. 5) of young *Deodar* in the Rámaserai valley, a tributary of the Kamalada, which runs into the Jumna below the Banál; but they are of no practical importance, and contain no large trees. I did not visit them, as it would have involved a long trip from the ridge, from which I contented myself with looking at them with a glass. The whole of this valley is richly cultivated and bears two crops a year throughout, indeed, it may be called the granary of this part of the hills.

9. The great difficulty with regard to any effective conservation of these Jumna *Deodar* forests will be in respect to the grazing. The immense sums exacted by the Rajah for grazing from the villages near the forests quite precludes the possibility of thinking of compensation, for the forests would not be worth it. The next favorable point is that, where fire has been kept out, the forest is so strong that it keeps down the grass, and the young trees seem very often to spring up readily in the face of all difficulties from grazing; I believe we must confine our efforts to keeping down the fire, which may reasonably be insisted on.

10. It will be seen that the Jumna contains but little *deodar* of any sort, but it would be difficult adequately to describe the enormous seas of chir (*longifolia*) forest, which line its bank. In these the trees must be numbered, not by thousands, but by hundreds of thousands, and many of them are of huge size. Government has, with a wise liberality, offered a munificent reward for the invention of machinery for the preparation of the Rhea fibre, and

it might, in its own interests, be well worth while, considering the large number of miles of railway—all the property of the State—that before many years will be at work in Upper India, to double, or even treble this reward for the invention of a thoroughly satisfactory process for impregnating, and so preserving from decay, sleepers made of *chir* timber; for it is quite certain that the *deodar* forests will never bear all the strain that will be put on them, besides which they are generally much more remote from the main rivers, and much higher up the hill side than the *chir* forests.

11. Like the hills on the left bank of the Jumna, those on the left bank of the Tonse are also covered with almost interminable forests of *chir*. Higher up the river near Datmir, chil (*excelsa*) takes the place of *chir*, but the latter may be considered the predominating tree. The Goroogad, running down to the Tonse from the west of the Kidarnath Peak, is full of an enormous *chir* forest.

12. Passing then, across the Tonse to the range which separates it from the Pabar, we come again into a tract of which the *deodar* forests are the distinctive feature. The *deodar* commences north of the Tonse near Gangar, and is scattered all over the range which separates the Tonse from its other main head-stream (the Panch Ganga) which joins it opposite Shankri. The hills here are rocky and precipitous, and the trees are chiefly confined to the small ravines and streams which run down from them to the river. The main blocks of forest extend from just below Gangar to about 2 miles below (opposite to) Datmir (No. 6), and on the further side of the range above Lior and opposite Kahsol and Raksha (No. 7). All this timber would readily come down into the river. I do not think there can be less than 10,000 or 12,000 available trees on this range.

13. As regards the floating capabilities of the Tonse above its junction with the Rupin at Naintwari, there is certainly very little water in it at the present season, nor in the Panch Ganga, which joins it opposite Shankree; but there is a fall in the river of near 2,500 feet from Datmir to Naintwari, or above 100 feet per mile; and the people say that in June or July an enormous torrent comes down both these rivers, and that the logs which Mr. Wilson cut near Datmir easily came down. The river bed is remarkably free from rocks, and there is no impediment as far I could see, except for a short distance above Shankri.

14. Proceeding downwards, there is a considerable amount of *deodar* on the spur which comes down to the river above the village of Koarbo (No. 8); also in the stream next to it, west of Koarbo (No. 9), all of which would readily work down into the river. These may be estimated at least at 3,000 trees.

15. We now come to the Rupin and its forests. This river joins the Tonse at Naintwari. On its left bank, just above the junction, there is a block of *deodar* forest above the village of Bitri, while the whole of the north bank of the Kharúr (a tributary of the Rupin), appeared to me to be lined with *deodar* forests (No. 12), and I was told by the people that the forest was all *deodar*. There must be at least 6,000 trees in these three blocks.

16. Passing to the right bank of the Rupin, there is considerable scattered forest of *deodar* on the slopes of the Kandighât Hill down to the Tonse (No. 14), and there is a large mixed forest, the lower portion being mainly *deodar*, while the upper consists of chil (*excelsa*) and *silver fir*, on the heights surrounding and above the village of Narayingaon (No. 13); these blocks may certainly be estimated to contain 4,000 available trees. It may be mentioned that Mr. Wilson has worked out timber much higher up the Rupin than any of these forests—from those belonging to Bassahir.

17. Passing out of the Rupin, round the spur of the Tarú (marked in the map Charú) Peak, we come to a large basin formed by the streams which run down from that peak and the ridge which joins it to the Lambartach Peak. These are called successively the Salda stream, the Motwargad, the Konigad, the Chilligad and the Matakanala. There is a little *deodar* under the spurs at the head of the Salda stream (not available). The Motwargad and Konigad both contain fine *deodar* forests of considerable extent (No. 15); the trees are very large, but they seem to me rather too remote to be worked with profit. But the people of the villages declared they would easily bring the logs down to the Tonse, and I had not time to examine the ground between, and certainly the hill side is sufficiently precipitous, and the work all down hill. The Chilligad (the largest of all these gads), contains a considerable mixture of trees—*silver fir, spruce, oak* and *deodar;* the *deodar* being fewest, but very fine trees of what there are of them. The Matakanala has a fine forest of pure *deodar* (No. 16), probably workable to the Tonse. These blocks certainly contain 10,000 *deodar* trees, but probably not above one-third of them could be ever got to the Tonse.

18. It is necessary, from this point, on account of the scarps, to ascend to the top of the ridge through a forest, mainly of *oaks* and *silver fir*, when you look down into the Pabar on the other side. Proceeding along the ridge, the point where the road crosses from the Tonse to the Pabar (from Siras to Gokul) is reached. Here commences a noble *deodar* forest (Nos. 17 and 18) on both sides of the ridge, equal perhaps to the best of our Jaunsar Forests. Neither of these forests are entirely pure, but the *deodar* is mixed chiefly with

raiee and *silver-fir*, and *chil*. The forest, to the east of the ridge, is the finest and purest. Here I measured six trees, quite close together, of the following girths respectively :—

	Ft.	Inches.	
No. 1	15	3	
„ 2	16	10	A noble tree, quite perfect.
„ 3	11	8	
„ 4	13	9	
„ 5	12	3	
„ 6	17	4	Slightly injured below.

All these trees were much over 100 feet high, and there are many trees like them all over the forest.

19. On the opposite (west), side of the Lambartach Peak are two forests (Nos. 20 and 21), which I saw last year from the opposite side of the Pabar, and appeared to be considerable forests. Proceeding around the Lambartach, there is a considerable amount of *deodar* (No. 19), mixed with *chil* above the village of the Bamsú in Suras; below this down to the Tonse is chir (*longifolia*) forest, as indeed is the case all along.

20. On the south side of the Lambartach Hill is Forest No. 22—a forest above 3 miles long by half a mile deep, full of noble *deodar* trees, right over the Tonse. This will be a most valuable addition to our stock of timber.

21. Besides the above, there is the Mandhol Forest (No. 23), west of the Tonse, which has not yet been included in any calculations. This forest is perhaps too high up to work at present, and as the lower part of the valley is full of rice-fields, it will perhaps be as well to reserve it for the present.

22. The forests between the Rupin and the Pabar (Nos. 15 and 22), cannot contain less than 25,000 trees; I am sure of these. One-third, or say 8,000, will certainly be at once available, and adding all the above blocks together, the Upper Tonse certainly contains not less than 50,000 trees, of which one-third at least, or say 15,000, may be worked out cheaply and easily, as the forests are not too far from the river and overhang it immediately, while the best of the Jaunsar Forests are fully from 4 to 12 miles distant from the river.

23. I feel very glad that I have been enabled to throughly examine all this block of forest before I made out the working-plan of the sleeper-work for the Tonse, as it will enable us to remove the sleeper-work for the present out of the immediate neighbourhood of Jaunsar, and obviate the inconvenience of the sleeper-work competing for labor so directly with the Chackrata works, which is a most important point.

24. I propose, then, at once to direct Captain Murray to fell 5,000 trees in blocks Nos. 6, 8, 9, 10 and 22, and perhaps in Nos. 17, 18 and 23, after more examination of the ground. Mr. Bagshawe may look after this work at once.

25. Captain Murray will also be directed to saw up at once about 2,000 sleepers, to be ready to put into the river in April, when it first rises, when 300 or 400 logs will be also put into the river; and, after an actual experiment, a decision will be finally come to, whether the logs should be sawn up into sleepers in the valley, or below in the Dún. Experiments will also be made in bringing down both timber and sleepers from different parts of the forests, as to cost and practicability; also in sawing up, both on the hills and in the river.

26. The above arrangement will enable Captain Murray by degrees to open out the mule tracks in the Jaunsar Forests, and to make slides, and otherwise prepare these forests for working hereafter. It is hoped, therefore, that it may meet approval.

27. I believe from enquiries, that if 15,000 or 20,000 logs can be got down into the river, there would be no difficulty at all in sawing up *a lakh of sleepers per annum* in these forests. I would, therefore, not be in too much of a hurry to commence sawing up too many sleepers before they are wanted, as they are sure to split and deteriorate more or less in a couple of years.

28. Something will have to be done to make the road practicable up the Tonse as a *footpath*; and one or two wire-rope bridges must be put up in places to render the forest more accessible, as the only way at present of crossing the river between Mandhol and Naintwari is by being slung in a noose under a rope, and being dragged arcoss.

29. As the whole of the forests of *deodar* north of the Tonse are in the Tehri Rajah's country, Government may be congratulated in having got a much better bargain out of the lease of his forests, than has been heretofore supposed.

From the Government of India, P. W. Dept., to the Secy. to the Govt. of the N. W. Provinces, in the P. W. Dept., No. 490 F, dated 2nd September 1870.

I am directed to acknowledge the receipt of your docket, No. 338 F, dated 31st December 1869, forwarding a report by the Conservator of Forests on the *Deodar* Forests at the head of the Jumna and Tonse rivers, together with the orders of His Honor the Lieutenant-Governor thereon.

2. In 1865, a portion of these forests was surveyed and reported upon by Mr. O'Callaghan, then Assistant Forest Surveyor; his report was forwarded to the Government of India in April 1866: it is not, however, alluded to in the papers now received. The results of Mr. O'Callaghan's survey seem, upon the whole, to have been confirmed; but it appears evident that the forests are much richer in *Deodar* than was supposed to be the case at the time of Mr. O'Callaghan's survey; and in a late communication received with your No. 118 S-R of the 16th May, the Conservator states that in his report he did not put down 20 per cent. of the trees which a close examination will show to exist. Under these circumstances, it does not appear necessary to consider the detail of the estimates contained in the report now under review.

3. So much, however, is clear that Major Pearson anticipates no difficulties in securing from these forests the needful supplies of timber to satisfy the requirements of the railways. This is satisfactory, and His Excellency the Governor General in Council merely desires to guard against too sanguine a view being taken of the resources of these forests. It is understood that, in order to supply the requirements of the Rajputana line, more than 15,000 trees will have to be felled annually in the *Deodar* forests of the North-West Provinces, one-half of which is expected as the yield of the Bhagirati, the other half being assigned to the Tonse and Jumna forests. The remarks made by Major Pearson in a late report on the Bhagirati forests show that the Conservator fully appreciates the necessity of following a systematic plan in the selection of the trees to be felled: and His Excellency in Council trusts that, in working these forests also, the most careful supervision of these operations will be exercised, so that the productiveness of the forests may not be injured. A careless selection of the trees felled may involve the ruin of the forests as far as future reproduction is concerned, whereas in many cases the growth of young *Deodar* may be stimulated by the judicious removal of a proportion of the older trees.

4. It is clear from the report that much work remains to be done to make these forests accessible by roads and bridges, and I am directed to state that the Government of India will readily sanction the needful funds for this purpose.

APPENDIX F.

REPORT ON THE GORAKPÚR FORESTS IN THE N. W. PROVINCES.

From COLONEL C. J. HODGSON, R. E., Secy. to the Govt. of the N. W. P., in the P. W. Dept, to the Conservator of Forests, N. W. Provinces,—(No. 39 F-C, dated 25th February 1870).

Acknowledges receipt of above, and approves of the proposals in regard to the clearing of the bounds and cutting of roads through the forest blocks at intervals of one mile, and states that the estimates for these works are looked for at an early date.

2. Approves also of the continuance of the employment of the Native Chief Ranger (Surbrakar), on duties not involving money responsibility, as proposed by Conservator.

3. In regard to the management of the cultivation, His Honor is not at present prepared to assent to this resting with the Forest Department. The revenue from it should go to Land Revenue, and His Honor presumes that it does so now, but nothing is said of this by Conservator. Unquestionably it should be leased on conditions that will make the occupants amenable to any arrangements thought necessary for the welfare of the forests; but this could equally be done, whether the cultivation be managed, and leases given, by the Collector, or the Forest Officer. Reference will, however, be made on the subject to the Revenue Department of this Government, on receipt of the report which the Conservator has called for, which should show in detail the various patches of cultivation, their area, rents and tenure. The limits within which cultivation is to be allowed will of course be laid down by the Forest Department.

4. The percentage paid to the Patwaris no doubt calls for enquiry; and the further report about it is awaited.

No. 40 F-C.

Endorsed by the Government of the N. W. P., in the P. W. Dept.

ORDERED, that copies of the foregoing be forwarded to the Secretary to Government of India, in the Public Works Department, for information.

From MAJOR G. F. PEARSON, Conservator of Forests, N. W. Provinces, to the Secy. to the Govt. of the N. W. P., in the P. W. Dept.,—(No. 15 A, dated 27th January 1870.)

REPORT ON THE GORAKPÚR FORESTS.

This Report will be divided as follows:—

I.—A short description of the forests and their general condition.

II.—Present state of forest management in Gorakpúr, and especially as connected with the revenue.

III.—Recommendations for the future.

PART I.

2. *Description of the Forests.*—The Gorakpúr forests consist of 18 isolated blocks, varying in extent from about 1,000 to 18,000 acres each. They are situated to the north of the Gorakpúr Station along the banks of the Rohni River and its affluents, and extend northwards up to the frontiers of Nipal. They are stated by Mr. Webber to contain an aggregate of 127,000 acres, but Mr. Thomas estimates 169,000. Generally they have been carefully marked off, and boundary lines cut; pillars have been erected, and maps have been made of them. But the boundary lines have been allowed to grow up, and there are now disputes as to the direction of some of them. It is necessary that where they march with other forests, they should be re-cleared, and that in future they should be carefully kept free from jungle. Everywhere the forests are surrounded either by grants, village lands, or by foreign territory. The following is a short detail of the forests:—

3. *Ramgarh Forests.*—This forest is in extent about 4,000 acres, and is situated about 4 miles east of Gorakpur. It is mainly a *sál* forest which has all the appearance of, from its proximity to the city, having been cut over and over again, till all vigour has been drawn out from the roots of the trees from repeated coppicing. It is probable that it is valuable chiefly for poles, which ought to be cut and sold from it, as it is perhaps doubtful if the trees are likely to attain any great size hereafter. The forest would probably also be better for thinning.

4. The bounds of this forest are all grown up, and should be cut again. Mr. Thomas will be desired to estimate for this in his next budget.

5. East of the Government forest, and marching with it, is a tract of jagheer *sál* forest of about 2 square miles in extent, belonging to Mir Ahmed Ali Sha, a holy man, who has preserved it for the sacred fire which burns at his Takia. This forest has been preserved for about 70 years, and

contains many *sâl* trees of 6 to 8 feet in girth, and 50 or 60 feet high, and of tolerable growth and straightness; and there would be probably more good trees if they were not standing quite so thick together. It is chiefly valuable as a practical example of what a little conservancy of even the rudest character will effect in a *sâl* forest. It is understood that Rs. 75,000 was offered, and refused by the Mir Sahib for the timber in this tract, probably of some 1,500 or 1,600 acres.

6. *Tilkonia Forest.*—Tilkonia forest is a tract of forest of about 4,000 acres north-west of, and similar in character to, Ramgarh. There are other small forests, also four patches of forests north of Tilkonia isolated from each other, and surrounded entirely by private grants and village lands. Their names are Bilánpur, Natua, Bari and Biki. The four forests contain about 7,500 acres, and all like Tilkonia contain small *sâl* bullies growing very thick together. The Biki forest seemed to contain some promising and well-grown young *sâl* trees along the Tiwár River.

7. All the above forests have been reserved since 1868, as previous to that date they were leased out to contractors, who cut down absolutely whatever they contained; it cannot be said that they yet contain anything beyond mere poles; but judging from the timber in the Mir Sahib's forest of Kúshmi, and in other grants which have been protected, I see no reason to doubt that, in course of time, fine forests may be again produced, as formerly without doubt large timber grew in them, while it exists to the present across the frontier in Nipal, and the soil and climate seem to possess all the conditions requisite for the growth of *sâl*. I saw some very fine *sâl* logs in the villages brought from Nipal.

8. *Dudhai and Madjar Forests.*—This is a huge tract of jungle stated by Mr. Webber to contain about 22,000 acres west of Bagapar, the western portion of it being merely a strip of grass bheers.

9. The characteristic tree is *sâl*, but it is largely mixed with *sein*, *simul*, *gúlar*, *jamun* and other trees. It is generally stunted, crooked, and by no means promising in appearance, and although in so large a patch of jungle some portions are, no doubt, better than others, I did not see here any really thriving young *sâl* trees. The boundaries have been allowed to grow up, and they much require clearing, in consequence of which there are disputes along several portions of the boundary line. This forest has been reserved for seven years.

10. *Jágpur Forests.*—West of the Dhudhai forest there is a long strip of waste along the Malwa River, which produces excellent thatching grass, which is exported to all parts of Gorakpur. And north-east of this, and between the Dudhai and Súnári forests is a piece of waste-land named Jágpur, also under the Forest Department, large portions of which have been brought under cultivation. There appears to be no exact account kept of this cultivation, as well as of other cultivated lands of considerable extent in different portions of the forests, especially along the Gunduk in Dúmakand; but orders have been issued to Mr. Thomas to have them all surveyed and measured up, and to send in a special report about them.

11. Passing from Jagpur into the Súnári forest, there is a piece of *sâl* forest, where the late Mr. Vipon attempted thinning operations. This is a good example, as showing what great caution is necessary in carrying out this operation, as in the natural *sâl* forest the ground is remarkably clear, and free from grass and scrub, although the trees are much too crowded, but where Mr. Vipon's thinning operations were carried out, it is hardly possible to move along on account of the bheer and other thorny bushes which have sprung up, while the young *sâl* trees instead of showing clean stems, have begun to branch out on all sides, and to spread themselves.

12. *The Súnári Forests.*—This is a huge block of jungle along the Malowa and Pias Rivers (feeders of the Rohni), said to contain about 25,000 acres. Some portions of it contain *sâl* saplings of moderately good quality, but the greater portion of the tract appears to be of exceedingly moderate character, and very largely mixed with *pentaptera*, *conocarpus*, *largerstrœmia* and *nauclea*. It is also remarkable for the enormous creepers with which it is filled, and which weigh down and destroy the trees in every direction. The whole is said to have been under cultivation about a century ago, but to have been deserted and thrown into waste by the oppressions of the Oudh Government. It is impossible to suppose that the greater portion of it will ever become of any great value as a forest, but it will, no doubt, furnish small timber of various sorts for the general wants of the country.

13. The best portion of the forest, as regards quality, is that between the two rivers, but almost every tree has been disfigured by tapping it for Rāl, and the creepers are enormous. Such a thing as a clean and well grown young tree is almost not to be seen.

14. *Nagwa Forest.*—North of the Pias River is the Nagwa Forest, a block containing 18,000 acres; it contains trees of a somewhat better quality than Súnári, but is equally infested by creepers. These two last forests have been reserved since 1855, and certainly do show some benefit from it, but no active operations have been carried out to improve them. Of the 46,000 acres contained in them, about one-third, or 14,000 acres is grass and jheel.

15. *Khas, Bharatkhand, and Dúnakánd Forests.*—Under these names, east of the Nagwa-Súnári forests, there is a considerable tract of grass and waste-lands extending as far as the Gunduk River, covered more or less with mixed forest and scrub jungle, but containing also a considerable amount of cultivation. Orders have been given to Mr. Thomas to have a map made of this tract, and to report exactly what cultivation it contains, as well as how much forest, and to find out exactly what it is worth.

16. *Forests west of the Rohni.*—These are as follows:—

East Lira about 8,000 acres, *West Lira* 18,000 acres, *Bari Bysi* 4,000, and *Bari Búban*, about 2,000 acres. These have all been conserved for about five years, and except Bari Bysi (which seemed to contain some promising young trees), they are mixed forests of *sâl*, *sein*, *tendú*, &c., of but moderate character. Nevertheless, as compared with the forests belonging to Zemindars and grantees which have been cut down without mercy, they have no doubt repaid by their improved appearance the small amount of care that has been spent on them.

Part II.

17. *Present state of forest management in Gorakpur, and especially as connected with the Revenue.*—To summarise then, the Gorakpur forests consist of several large irregular blocks of *sâl* and mixed forests along the Rohni and its dependencies; they contain hardly any sound trees of the size that may be properly called timber trees, the trees in the Nagwa and Súnári forests, which are somewhat larger than the rest, have been so injured by repeated tapping for Rāl and other noxious practices, that they have long ceased to exist as healthy trees, and are in consequence crooked and knotty even when sound; creepers are a terrible pest to the trees, and except in a few exceptional cases, the young trees do not look particularly healthy and promising. Nevertheless, these forests are not without value. They are needed to supply the ordinary wants in wood and grass of a large agricultural population extending from the Nipal frontier down to the Ganges, and in some degree they are capable of meeting the requirements of large cities like Benares, Dinapur and Patna, while no doubt with care the condition of the young growth of timber will improve, and if properly managed, they may certainly be made to yield a good revenue. Moreover, the forests are mixed up with large tracts of grass-land and jheel, in which there is much cultivation, from both of which a considerable profit ought to be realised to Government.

18. The sources of revenue are as follows:—

1*st.*—Sale of dry wood and fuel.

2*nd.*—Sale of kuris, bullies, and small building wood for native houses, wood for boat-building, also wood for agricultural instruments and the like.

3*rd.*—Sale of thatching grass and fodder.

4*th.*—Grazing dues.

5*th*—Revenue from cultivation within the limits of the forest tracts.

6th.—Miscellaneous products, such as skins, fish, fruits and mowah, &c.

19. The revenue was about Rs. 6,100 in 1867-68; last year Mr. Vipon raised it to Rs. 13,000, and if it had not been for his death, it would probably have been much higher; and this year under Mr. Thomas it has already touched close on Rs. 20,000, and probably will reach at least Rs. 22,000 before 1st April, if not more. It is very unsatisfactory that in previous years it was so low as it was, and it does not seem creditable to the Surbrakar and establishment that it was so. The Conservator had some doubts about the propriety of keeping this man on in the service, for there seems to be much which is far from satisfactory regarding him, and as he has suffered from a dangerous and painful disease for several months, from which he has just recovered, he is not physically very fit for his work; nevertheless, as he has been 15 years in the service in this department, and as in some respects he seems to have done good work, especially in the mutiny, a further trial will be given him under strict definition of his duties, which will not extend either to the collection of minor forest produce, or the management of the cultivation in the forest limits. Mr. Clifford, the late Magistrate, recommended the Conservator strongly to have the man removed to another District, but he would be entirely useless elsewhere, and it is only his local knowledge and acquaintance with the timber trade that makes him useful here. As far as can be judged, there seems little doubt that if proper measures be adopted for bringing small timber to market, an income of Rs. 50,000 may easily be raised; but the revenue is always liable to serious and uncertain competition from the action of grantees, as when a grant is being cleared, the wood is almost given away gratis, and then the demand on the Government forests ceases for a time.

20. As regards the extent of land under cultivation within the forest limits, it must be very considerable, but no proper account whatever has been kept of it, and there is no mention at all of it in Mr. Webber's Return of Revenue for 1867-68. But on calling for an account, a return of Rs. 1,557 in 1869-70 has been presented, and the Surbrakar admits to 3,058 beegahs of cultivation, though in the list given in by him no mention is made of Jagpur, which he states was only put under cultivation this year, and which is at least 250 bigahs in extent; orders have been issued to Mr. Thomas to put on an Amin, and have all this cultivation measured up at once, when a separate report shall be made about it, but it ought not to be separated from the control of the Forest Department; for villages, if properly managed, are most useful, and are actually a protection to forest interests, while, if not under proper control, they will be equally harmful, and this control the Civil Authorities can never be quite in a position to carry out, however willing they may be to do so.

21. But of the 20,000 acres of grass and jheel mixed up in the forests, as well as some of the inferior portions of the forest itself, if judgment be used, much may be broken up and cultivated with profit. The cultivation does not seem to have attracted Mr. Webber's attention in any of his reports, though it must have been going on for some years.

22. Enquiry has been made as to the timber trade from Nipal through Gorakpur; it would seem that a good deal of *sâl* of middling quality is taken down the Gogra; and judging from the size of the logs, and the prices said to be given, the price would seem to be about 12 annas a foot in the Nipal forests.

Part III.

23. *Recommendations for the future.*—The condition of the forests in Gorakpur resembles that of the Dún in one particular, *viz.*, that they are everywhere mixed up with, and surrounded by private forests and grants, and they present the same difficulties of management in consequence. The following steps are recommended to be taken to put matters on a sound footing:

1*st.*—That the boundaries be all re-cleared, wherever they march with other forests, to a width of 35 feet, and where pillars are wanted that they be erected, as they are not nearly enough pillars at present.

2*nd.*—That where the boundaries are crooked, they be straightened where it is possible to effect an agreement by exchanges, and for this the aid of the Civil Authorities must be asked.

3*rd.*—At present from the extreme density of the larger blocks of forest, such as Dudhi, Nagwa and Súnári, it is impossible to penetrate them, even to examine their

contents and condition, much less can carts enter them to carry away wood and forest produce. The consequence is that a system of picking at the outsides of the forest goes on, which is exceedingly objectionable and prejudical to forest management. It is therefore recommended that forest lines be cut 35 feet broad, and a mile apart, through the larger blocks, in order that access may be afforded to all parts of the forest. These roads will also materially aid in the forest revenue arrangements.

4th—It is necessary that steps be taken to put the cultivation which has grown up within the forest limits, on a proper footing. For this end, orders have been issued to Mr. Thomas to have it all properly measured up, and a register made of all the plots, with the names of their occupants; a regular progressive assessment will then be arranged for the land, and it is recommended that leases for eleven years only be issued, so as to prevent any possible rights of occupancy growing up in the forests. The Forest Department should, however, retain entire control of such cultivation, as the extent to which it is permitted to develope itself must depend entirely on the amount of grass required by the people from the forest lands. It will be desirable, as much as possible, to cultivate the borders of the forests themselves, which will present a great safeguard from accidental fires in the grass bheers by preventing the fire spreading into the forests.

5th.—There are about 300 *sâl* logs of very moderate quality in the depôt at Sakivi on the Rohni, and it is said that there are about 300 more logs lying in the forests. It is recommended that some boats be built with a part of this timber, which it is believed may be done very cheaply, and the whole lot be taken down to Dinapoor in the rains. There seems no sale at present up here for this wood, but it is believed that in this way a large profit may be derived, and a trade in wood eventually established.

6th.—Mr. Webber recommended, and the Commissioner of Benares supported him (letter No. 292 of 27th July 1867), that the Native Surbrakar should be encouraged to honesty as well as to exert himself by getting a percentage on the revenue. This does not appear to have been noticed by Government, but I would beg to express entire concurrence in the principle, with this modification that the commission so allowed should be divided rateably among the *whole establishment*, and not be given to the Surbrakar alone, and that it only be paid, *first*, on the *profit* of timber operations; *second*, on any excess over a fixed minimum of general revenue. If the payment of such a commission be sanctioned, and if it be divided among the establishment, every man will be interested in looking after his neighbour, and seeing that he does not cheat, while it is only for *extra* exertions and *extra* honesty that a percentage can reasonably be paid at all. If this principle be agreed to, the Conservator would ask for sanction to fix Rs. 20,000 as the minimum of general revenue, and to pay to the establishment 5 per cent. on all *excess* collected over that sum, and up to Rs. 30,000. And if the general revenue *exceed* Rs. 30,000, then to allow 10 per cent. on all excess over Rs. 20,000; also to pay 5 per cent. on *all profits* derived from sale of timber cut and sold by the Department.

7th.—It seems to the Conservator that the present forest establishment is far too large and far too ill-paid. There are 38 Chaprasis, besides two Office Peons, who get each Rs. 4 month, but are entitled to Rs. 5, and their generally well-to-do appearance quite belies the idea that with grain at present prices they exist on their pay. It would be far better to decrease the number of men and increase their pay, and to give good men some hope of promotion, and the following revised scale is recommended without any additional cost to Government :—

The present establishment for Office and jungle consists as follows :—

		Rs.
1	Chief Ranger (or Surbrakar)	50
1	Native Writer	25
1	" "	17
1	Head Ranger	10
40	Chaprasis (or Watchers) at Rs. 5	200
	Total ...	302

Besides which, an English Writer (or Babú) has been allowed for the accounts since they have been separated from the Civil Department who is paid from the works.

It is proposed to revise this establishment as follows :—

		Rs
1	Head Ranger at Rs. 50	50
	8 *Assistant Rangers.*	
1	Assistant Ranger at Rs. 25	25
2	" Rangers, " 20	40
2	" " " 15	30
3	" " " 10	30
	22 *Watchers.*	
5	Watchers at Rs. 7	35
12	" " 6	72
5	" " 5	25
	Total ...	302

This will give a Ranger and a Watcher for each of the larger forests, with two Watchers for Dhudhi, Nagwa and Súnari; also one Assistant Ranger exclusively to look after the cultivation, and one Chaprasí for the Assistant Conservator's Office. The Babú, who does the English accounts, must also do the vernacular work of the Office. Considering the condition of the forests, and the temptations the men are exposed to, the above rates of pay are not excessive, as no increase is asked for; perhaps this arrangement may be sanctioned at once by the Government of these Provinces, and measures should be at once taken to weed out the useless and bad men.

8th.—It appears that there prevails in this District a system of paying a percentage of one anna in the rupee on the forest revenue to the Patwaris of the District. Enquiry will be made as to the authority on which this payment is made. Mr. Webber does not seem to allude to it in his report, but it has certainly gone on perhaps since the Province came into British possession; it is done in no other Province or Division; the Patwaris do not work at all for the Forest Department, and the Conservator feels quite sure, that under present circumstances, Government in no way contemplates making this payment to them in addition to keeping up a large forest establishment. About Rs. 1,000 have been already paid this year under this head; the Assistant Conservator has been directed to pay no more on this account till enquiry can be made as to how the practice sprung up, when a separate report shall be submitted to Government about it.

24. Some arrangements will probably be required for a small transfer of funds next year from other Divisions, if the recommendations made under heads 1, 2, 3 and 4 are sanctioned. These can be made in due course when the necessity for them occurs.

25. In concluding this report, the Conservator cannot help saying how much he was struck by the numbers of noble *mangoe*, *pipal* and *tamarind* trees, both in enormous groves, and standing singly, which are found everywhere north of Gorakpur. Seldom elsewhere in India has he seen such fine trees, especially as regards the *mangoe*. It would seem, then, that if care be taken of it there should be no reason why the *sâl* should not flourish equally well, and he fully believes that it will be found to do so.

26. Mr. Thomas has managed these forests exceedingly creditably, considering that he came here without any knowledge of forest work, and has only had written instructions to guide him.

Memo. by Dr. D. Brandis, Inspector General of Forests, on the Report on the Gorakpur Forests, dated 29th April 1870.

This is an Inspection Report submitted by the Conservator to the Government, North-Western Provinces, and sent for information. It calls for no orders.

There are only two points which call for notice, but no communication to the Local Government seems needful at the present time.

In para. 5 Major Pearson notices a remarkable private forest in the vicinity of Goruckpoor, belonging to a (sectarian) Musulman place of worship, the wood of which is used to maintain a sacred fire. One of the predecessors of the present incumbent commenced to preserve this forest it is believed, about 70 years ago, and the result is excellent. I examined the forest in 1863, and can bear testimony to its condition, which is well described by Major Pearson. It is the only *sâl* forest with which I am acquainted that has been intentionally preserved for so long a time.

In para. 20 and in other places, the Conservator brings to notice a large extent of cultivation that has apparently sprung up quite recently within these forests. In 1863 I did not notice any in the portions examined by me.

Major Pearson has set on foot an enquiry on the subject, and has promised a special report to the Local Government. There is a large extent of grass and jhil land included in forest limits, which Major Pearson says may be broken up and cultivated with advantage, but he urges that this land ought not to be separated from the control of the Forest Department. He adds that villages, if properly managed, are most useful, and are actually a protection to forest interests, while, if not under proper control, they will be equally harmful.

The North-West Government admits that these enclosures within the forests should be leased on conditions that will make the occupants amenable to any arrangements thought necessary for the welfare of the forests, but thinks that this could equally be done, whether the cultivation be managed and leases given by the Collector or the Forest Officer. On receipt of the Conservator's report, reference will be made, it is said, to the Revenue Department of the North-West Government.

The revenue realised from these plots should, in the opinion of the North-West Government, be credited to land revenue.

This case involves a very important question,—whether enclosures in a Government forest in which no rights of occupancy have been acknowledged at the time of settlement should, in regard to revenue matters, be placed under the control of the Forest Department.

I consider it essential that they should be thus placed. Otherwise, if a third authority has a voice in this matter inside forest limits, encroachments are difficult to prove and to prevent, and the resumption of such land, if required for forest purposes, becomes difficult. Such land should, as a rule, be given out on annual pátás (leases), not on 11 years leases as Major Pearson proposes, at least not at the outset, and the leases should be in the form of a regular agreement which will stand before a Court of Law.

I had latterly occasion to go into this matter in Sind and in the Central Provinces, where considerable areas of (generally shifting) cultivation are included in some of the State Forests, and the question is referred to in my Sind Forest Report, and the reports written with regard to last year's tour through the Western Division of the Central Provinces; and though, neither in these cases, nor in that of Gorakpur, does the question call for the immediate action of the Government of India, it may be useful here to state a few of the leading points. I repeat that the present remarks only relate to lands in which no rights of occupancy are acknowledged; in other words, to lands that are cultivated by squatters. It is not quite clear, I think, from Major Pearson's Reports, whether the cultivators in the Gorakpur forests have rights of occupancy, or not; this will appear from the further correspondence on the subject, which will come before the Government of India either separately or in the Proceedings of the North-West Government, and may then be taken up if it should appear needful.

In all extensive forest reserves, there are of necessity included blanks, not covered with forest, or incompletely stocked, which it will either not pay to stock by planting, or where operations of that description can only be extended gradually. From such tracts it seems desirable to make some revenue, if such can be done without prejudice to the forests. Moreover, in some cases, cultivation can be made serviceable for forest purposes. Thus, it is probable that, in Burma, and possibly also in Mysor and Khurg, *teak* will be raised by the aid of cultivation in a way analogous to what is called the field forest system in the northern part of the Grand Duchy of Baden. And in Sind, cultivation has very properly been introduced by Mr. Fenner in order to pay for the irrigation of the land, and thus indirectly to benefit the surrounding forest, and to raise a crop of *babul* to stock the fields after they are abandoned. In Mysor and Khurg it has been proposed to authorise the Conservator to permit certain villages of a hill tribe, called Karúmbers, to cut a limited extent of kumris inside the reserves, to secure their services for the working and the protection of the forests. Again, in certain localities, such as the great Trapp Districts of Central and Western India, it has generally been noticed that forest thrives fairly well on slopes and in valleys, but that the shallow soil of the extensive flat terraces and high lands produces only a poor and stunted description of jungle. Such lands are frequently fairly productive under the plough with long fallows between, and where squatters are anxious to take them up for a temporary settlement on conditions which provide for the security of the forests, such lands should be utilised at least until we see our way clear towards stocking these extensive blanks either by excluding fires, or by other means.

It seems to me clear beyond dispute, that the management of such lands must be in the hands of those officers who are entrusted with the charge of the estates of which they form a part, and considering that the Forest Officers will have the greatest interest in making these squatters in their forests contented, I believe that the arrangement advocated by me will be found to work in a satisfactory manner.

I am aware that the greatest caution will be needful in this matter, for anything like continued occupancy of the same spot, though not sufficiently long to create a legal claim, will always be held to give a strong moral claim by the settlers.

Nevertheless, I think there will be less difficulties and less complications if land cultivated as a temporary arrangement within forest limits remains in charge of the Forest Officers.

The revenue realised from such cultivation should, in my opinion, be debited to "Forests", and not as proposed by the North-West Government to Land Revenue.

APPENDIX G.

REPORT ON THE JHANSI FORESTS, IN THE N. W. PROVINCES.

From COLONEL C. J. HODGSON, R. E., Secy. to the Govt. of the N. W. P., in the P. W. Dept., Forest Branch, to Conservator of Forests, N. W. Provinces,—(No. 139F-C, dated 28th June 1870).

Jalún.—States that the grass preserves should remain under the Conservator, and endeavours should, His Honor the Lieutenant Governer considers, be made to establish the growth of wood in them. But no considerable expense should be incurred for the purpose. *Babúl* seed should be sown before the rains, and would probably come up, as in the Jhansi preserves. Certainly any addition to the trees in the bare and bleak country referred to is an object to be kept in view.

2. *Jhansi.*—It is to be regretted that the outlay upon these plantations should have been to a great extent thrown away. It cannot be supposed that they would have succeeded without a large expenditure. They could not have been kept weeded and clear of the jungle, which has choked the young trees, except at a considerable outlay; and doubtless attempts at planting them out would have been attended with the result stated by Conservator, who has acted rightly in desiring further expenditure on watering and tending the trees to be put a stop to.

3. As the large number of Chaprasis now employed was allowed with reference to these plantations, this should now be decreased as Conservator suggests. His Honor, therefore, directs that the number be reduced to eight, and be further curtailed as occasion admits. A few "Suherias" may, however, be employed during three months of the year, as Conservator proposes.

4. The measures proposed in regard to conservation of the existing forests—applying those for preservation from fire, first to the *teak* forests, and gradually extending them to forests of other kinds, is approved.

5. The Conservator disapproves of the system now in force for collection of minor produce by the Forest Department at depôts and sale there, and shows the results to have been small. He is requested to report how he would propose to meet the demand which exists to some extent for this produce—bamboos, charcoal, fire-wood, &c.—so that it may be made remunerative.

6. *Lallatpur.*—Enquiry will be made of the Commissioner in regard to the supposed failure to completely suppress dhya cultivation, and the necessity for doing so impressed upon him.

7. The measures of conservancy proposed seem all that can be undertaken. Some reduction in the cost of establishment may, His Honor considers, be effected, and the amount should henceforth be limited to Rs. 1,000 per annum; the Deputy Commissioner being allowed to arrange in regard to Darogahs as seems to him best.

8. *General remarks.*—The appointment of a special Forest Officer should certainly be left to the future, and as Conservator suggests, the measure may be further considered when the Dún Forest arrangements have been established on a thoroughly satisfactory footing.

9. His Honor is not of opinion that Government is called upon to take the exceptional course proposed to make a supply of *sál* wood available for these districts.

10. The report is of general interest, and will be published with a few omissions, in the selections.

11. The remarks on the question of the former existence of forest on the table-land, north of the Nerbudda, and on the northern limit, of *teak* forests, are interesting, and His Honor is inclined to agree with Major Pearson's opinions.

No 140 F-C.

Endorsed by Govt. of the N. W. P., in the P. W. Dept.

ORDERED, that a copy of Major Pearson's Report, with a copy of the foregoing, be forwarded to the Secretary to the Government of India, Public Works Department, for information.

From MAJOR G. F. PEARSON, Conservator of Forests, N, W. Provinces, to Secretary to the Government of the N. W. P., in the P. W. Dept.,—(No. 52A, dated 11th April 1870).

I have the honor herewith to forward a report on my tour of inspection to the Jhansi Division. I shall first give a brief description of the Government forest tracts in each Division, and then proceed to make a few remarks on their management, both at present and for the future.

2. *I. Jalún.*—This District is singularly devoid of trees of all sorts, and there is no forest in it at all. Three grass rumnahs however are placed under the Forest Department, *viz.*, Tinrú in the Pargana Urai, Pattaria in Kúnch, and Malikpur in Jalún, containing in the aggregate an area of about 4,600 acres.

3. The revenue for 1868-69 amounted to Rs. 662, against an expenditure of Rs. 614; but in the previous year the expenditure amounted to Rs. 1,409 against a revenue of Rs. 793. It would seem hardly advisable to go to the expense of cutting the grass, unless it is certain of being sold.

4 The main reason which renders the retention of these grass lands, under the Forest Department advisable, would seem to be that, if hereafter it should be deemed proper to place a Forest Officer in charge of this Division, plantations of *acacia* (*babúl* or *sissú*) might perhaps be advantageously formed on them, as well as on the banks of the Jumna and Bhetwa Rivers; for considering the great want of forests in the District, it might be worth while to go to some expense to raise even such common sorts of trees as would yield wood for the carts and ploughs of the agricultural population, and also obviate their using the droppings of the cattle, which is the natural manure of their fields, in place of fuel. In case the rumnahs are continued under the management of the Forest Department, the expenditure must be rigorously kept within the income derived from he grass, and as in past years, no excess under this head must be in any case admitted so long as no tregular forest operations are carried on. There should be a net annual income of about Rs. 1,500 from the Jalún grass lands.

5. *II. Jhansi.*—The Jhansi Government forest lands extend over 23,138 acres. The main portions of them are situated along the Bhetwa River in the south-east corner of the District, and are known as the Babina Forest. This forest, which I examined, contains some small *teak* along the banks of the Bhetwa. Besides the above, there are four small patches of very moderate scrub jungle, situated along the east boundary of the District, marching with Hamirpur, and two patches in the Mhow Pargana, south-east of Jhansi. These last six forests contain no *teak*. The area of the Babina Forest is upwards of 11,000 acres, or half of the whole.

6. The forest lands of Jhansi differ in no way, either in character or appearance from the whole of the northern slope of the great Vindhya Range, from the Kúttra Pass in Mirzapur, right away as far as the jungles of Baug Tanda and Chikulda, 100 miles west of Indor, and bordering on Guzerat. The main staple of the jungle consists of various species of the prickly *acacias* growing in scrub bushes; the *khair* (a *catechu*) and *reunga* (a *lencophlœa*) with one or two creeping *acacias* being most abundant. Largely mixed with them is the *dhak* in rocky grounds; and *mowah* trees grow abundantly in the low lands, where there is any depth of earth, and where commonly there is some cultivation. The *teak* is found along the banks of rivers and nullahs, and occasionally on the sides of the small hills which rise out of the plain near the rivers, and which generally also contain some bamboos of good quality.

7. The rocks throughout these Districts seem to be either granite, porphyry or quartz; but there are indications of trap in the Betwa, and in the southern portion of the District, and doubtless in other places also; vegetable mould there is none except in the valleys and the low lying lands The hills are bare hard rock, covered with boulders and gravel. It is as hopeless a locality to expect a forest to grow upon as I have seen anywhere.

8. I must differ from Mr. Webber's Report on the Jhansi forests in regard to the question whether true forests ever existed in the Jhansi Division, as he supposes that such was the case, and that they have been destroyed; no doubt they never have had a fair chance given them, for the reckless cutting and burning of the jungle for dhya cultivation, which has been practised by the jungle tribes here as elsewhere in every part of Central India, has utterly prevented the formation of a coat of vegetable mould in which a forest could grow; but from long and extended opportunities of observation, I am convinced that it is an error to suppose that good timber of any size *was ever produced* on the north slope of the Vindhyas. I cannot say that I have ever seen a single indication of a true forest along the whole of the range; and all natural elements for the production of good timber of any size are certainly wanting. *Teak* is found in places all along the range; and where it has been protected (as is the case in some parts of Pannah, north of Dumoh, in some small zamindarees north of Ságar, especially in the forfeited state of Shahgarh, and I believe, also in Urcha) building timber of moderate size may still be obtained; and I have even seen some beams of large size in the old Shahgarh and Ratgarh Forts, which, no doubt, were cut in favourable localities of these hills. In Ságar and Dumoh, since the order was issued forbidding it being cut in 1858, it has made considerable progress; but, nevertheless, I believe I am right in saying, that these arid rocks are *not calculated to produce forests, and that, as a rule, they never have existed on them*, and that the jungle *has always been as now, a miserable scrub.*

9. Still it is, perhaps, in such places as these that the covering of the ground, with some sort of tree vegetation, is attended with the greatest benefits; it is not necessary here to recapitulate them But the great practical difficulty to be met in Jhansi is the want of a revenue from which to meet the cost of the operation. Timber there is none for sale, fire-wood is a drug in the market, and the manufacture of kuth or catechu is unknown in Jhansi, though it is practised in the Balabhat jungles of Lallatpur; and the sale of grass and bamboos, with a very small miscellaneous revenue, is all that can be looked to for revenue.

10. In 1864-65 the revenue amounted to Rs. 2,929, and the expenditure only to Rs. 988, leaving a surplus of Rs. 2,000. The establishment was then largely increased according to Mr. Webber's recommendation; but I do not find the result has been satisfactory. For in 1867-68 the actuals

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NOTE.—The areas given do not coincide quite with those in Mr. Webber's Report; but in Lallatpur the settlement has since entirely altered the limits of the Government forests, as the village forests had not been assigned when Mr. Webber wrote; and in Jhansi and Jalún he himself only gives approximate areas.

(receipts) were Rs. 2,264, or Rs. 700 less than in 1864-65, while the expenditure was Rs. 3,750, or four times what it was before, and a deficit remained of Rs. 1,500; and in 1868-69, the actual (receipts) were Rs. 2,485, against an expenditure of Rs. 6,879, with a deficit of Rs. 3,400; of the latter Rs. 2,677 was spent on plantations.

11. Of these plantations it is necesary to speak, for Mr. Lang, the Deputy Commissioner, directed my attention to them, as he considered that a great deal of money was being squandered in a useless manner on them. They seem to have been formed with the best intentions at the suggestion of Mr. Webber, and are properly speaking nurseries, not plantations. They are formed as follows:—

12. About two acres of land have been roughly fenced in each Forest District, and planted with seed of *teak*, *mowah*, *sissú*, and *babúl*, in holes about a yard apart; and it was intended that the seedlings should have been transplanted out into the neighbouring jungles.

13. But from various reasons, and chiefly from the difficulty of watering them, this has not been done, and now half the little trees are dead, and the rest are too old to plant out; while for the most part they are all withered by the frost, and choked in the long grass, which is not cleared away from around them; and as regards the *teak*, in many instances, three or four dry and burnt shoots show that the jungle fires have destroyed the nurseries as well as the rest of the grass, and that the *teak* seedlings were only coppices from the original roots, like most of their neighbours in the forest. Even if they were transplanted (as some few have been), they must, by necessity, die off, because we cannot keep young trees at any distance from the wells regularly watered; and transplanted trees are very delicate, and would require watering for some years after removal from the nurseries, so that the money spent on nurseries is wasted.

14. But the watering of these nurseries is now carried out at the cost of about Rs. 2,000 a year, and if the trees were planted out in the forest, they could never be watered at all, for the rocky nature of the ground will not admit of wells being made except in certain places, and at a very considerable expense.

15. And, indeed, it may be taken as an accepted fact, that plantations can never be carried on successfully in a *rough way*; if they are made at all, they must be worked *on a proper organised system* with regular supervision. This supervision the District Officer can never afford time to give in distant parts of the forest, and as the money at present is *being simply wasted*, I have requested that further expenditure under this head should be stopped.

16. There are also some plantations of *babúl* in the Mot Pargana which have been made some years ago (I believe by Mr. Jenkinson); but from being sown broad-cast, the young trees have come up exceedingly densely in some places, and not at all in others. It would be advisable to convert these into a sort of mixed timber and coppice plantations; but the Deputy Commissioner tells me that he cannot get the people to do the work, even on promise of having the produce of the thinnings gratis, and in that case it is perhaps hardly worth while to spend more money on them, and they may be let alone to take their chance.

17. It seems to me, then, that the most practical work to turn our attention to in Jhansi, is *to take care of the teak*, as this will, if looked after, certainly attain a sufficient size to be very useful for all ordinary building purposes; and also, if possible, to cover the Government forests with a certain amount of trees, which, in time, might yield a proportion of vegetable mould, in which a better class of forest would grow up; and to do any good in this way, our great battle must be with the jungle fires.

18. Any attempt to keep out fire at first on an extensive scale would be too costly, and would be nearly certain to be unsuccessful. But there is no reason why it should not be attempted on a small scale on the *teak*-bearing tracts which are conveniently situated along the river bank, and I have instructed the Daroga how to proceed to clear a broad line, by burning the grass while green, to a certain width outside the *teak*-bearing tract, and so isolating it from the rest of the grass plains. If the attempt be successful for a year or two in the *teak* tracts, the area to be protected from fire might be extended hereafter by degrees.

19. Added to this, the *teak* must be equally protected for some years from being *hacked*, *cut*, *or injudiciously thinned*, on any pretext whatever; and if, also, the *mowah*, *huldú* and *bamboos*, wherever found, be reserved, I think little more at present can be done. It may be said that the Government forest lands are already marked off by low pillars of a very good pattern, which is a good work effected, as the Government right to act as they please in the forest, cannot be called into question. The Jhansi Forest Rules, which have been sanctioned by Government, seem to provide for all this.

20. To equalise the revenue and expenditure, it is thought that several of the permanent establishments of Chaprasis may be discharged, and a few extra Suherias put on for a portion of the year only, *viz.*, from March till June, when fires are most to be guarded against when the *mowah* is ripe, and pilfering of all sorts is most likely to take place. There are at present in Jhansi 16 watchers, which is as many as we have for Kumaon and Garhwal, with an income of 3½ lakhs. I should think eight were ample for every purpose, and as far as the revenue is concerned, six collected in 1864-65 apparently, as much as the sixteen do now; but the exact number to be maintained, had better be left to the Deputy Commissioner, as he will be the best judge of what is absolutely requisite. I am decidedly of opinion that one man may, for the greater part of the year (as he did before the increase of establishments), take care of two or three different patches of forest of the size that these are. If this be done, the rent of the grass lands and of minor forest revenue will easily cover the cost of establishment, and the amount necessary for anti-fire operations. The charcoal burning and stacking of grass, and charcoal for sale had, in my opinion, better be discontinued,

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NOTE.—By the Vindhyas is meant the mass of hilly country to the north of the Narbad River, which is generally characterised by a scarp to the south front, and a gradual slope into the plains of the Jumna and Ganges to the north.

for Rs. 1,050 expended under heads AI, II and III in 1867 68, seem to have only produced Rs. 1,420 of revenue in the actuals of 1868-69, and in this the pay of the establishment engaged is not considered.

It is supposed that some income might be got by issuing passes for bamboos, poles, &c, and it would be proper in that case for the Forest Officer to settle each year a part of the jungle where they should be cut, as recommended by Mr. Webber. But direct forest operations of this petty nature are hardly advisable, and only serve the establishment as a means of making money.

21. *III. Lallatpur.*—The area of forest lands in this District belonging to Government amounts to over 100,000 acres as marked off after the recent settlement, and the greater portion of these have been regularly demarcated, and pillars have been erected to denote the boundary. The main portion of the forest lies along the Bhetwa in the north-east and north-west corners of the District; in the south in Balabihat, and in the south-east in Pergunnah Marawra Narhat, the latter being known as the Lakanjir forest tract. It is a mixed forest of *Terminalias*, *Acacias*, *Diospyros*, *Teak* and *Bamboos* of entirely the same description as that which forms the mass of the jungles in the Ságar and Dumoh Districts of the Central Provinces. Indeed, the Lakanjir jungle is only a continuation of the Shahgarh and Hirapur forests of Ságar, which contain a large amount of small *teak* of indifferent quality.

22. The system of dhya cultivation, or of cutting and burning the jungle for the purpose of rearing a crop of millet (kodú or kotki) has largely prevailed in this District, and has mainly contributed to the destruction of the forests. It is to be feared that, though prohibited, it is still carried on here even in the Government Forests. It has been put down almost everywhere in the Central Provinces, and it should be at once suppressed in the Government Forests of this District also; and there should be no greater difficulty in doing so here, than there was in the Central Provinces.

23. There is a considerable amount of *teak* in various places. It has suffered terribly from repeated coppicing, and it may be presumed that the roots of the old stumps are for the most part too much exhausted to produce vigorous shoots. But its condition does not seem worse than that of the *teak* in Ságar when its conservation was first taken up, and the progress that it has made there in the last ten years is considerable. For, although it is not to be supposed that the gnarled and crooked shoots, which are now seen to spring up from the old roots, will ever grow into large or straight timber trees, yet a careful examination will show that among them, even now, there are a number of straight young trees which are independent seedlings, and which, it may be presumed, will eventually become vigorous young trees. Every year that the forests are protected, the number of these seedlings will increase, and it is to be hoped that in time they may supplant the crooked shoots which spring from old roots, and the only value of which is to cover and protect the ground on which a healthy young forest may be produced. There seems no reason to despair of this taking place, for all over the north and west sides of Ságar, a fair show of *teak* is growing up on all sides, and the forest of Lakanjir in Lallatpur is *bonâ fide* a portion of the same plateau.

24. The following is a statement of the principal *teak* tracts in Lallatpur, and a sort of approximate area of them :—

1.—A long slip of about 2 square miles in area extending along the Bhetwa, north-west of Talbehut. This is similar to, and indeed a portion of the Babina *teak* forest in Jhansi on the opposite side of the Bhetwa, which was described in the last section.

2.—The Haraspur tract south of Talbihat, 50 acres.

3.—The Seonee tract, 10 miles south-west from Lallatpur, about one-third of a square mile, very poor in quality.

4.—The Dúdahi tract; this is a huge mixed forest; but there is a small patch of *teak* about 30 acres.

5.—The Parol Forest in the Balabihat jungles, about 60 acres of *teak*.

6.—The Maddenpur Forest on the Dasan River, south-east of Lallatpur, about 30 acres of *teak*.

7.—The Lakanjir Forest, bordering on Dumoh and Shahgarh in Ságar; here there are some 28,000 acres of mixed forest, in the whole of which *teak* exists more or less, but of which, probably one-fourth is principally a *teak* forest, the best being along the valley of the Dasan River, where on the Ságar side there are now some very fair young trees growing up, and where eventually it may be advisable to mark off a special reserve in Lallatpur, as the *teak* from this place could be floated down the Dasan into the northern Districts, where it is much required.

25. I marched by jungle paths, a distance of at least 50 miles, from Malthon to Shahgarh along the line of hills which separates Lallatpur from the Ságar District, passing from Ságar into Lallatpúr, and back again into Ságar, with a view to examining this last tract of jungle, which is the principal *teak* forest of Lallatpúr. It must be borne in mind that this is very nearly, if not quite, the most northerly point where *teak* is found growing indigenously, and it certainly seems as if it were dying out here, for in no case is the *teak* north of the Narbada equal in quality to that south of the same river, and, indeed, the further north one goes from the Narbada, the poorer the quality of the timber seems to become.

NOTE.—The exact number of acres cannot be given just yet from the Settlement papers.

26. From the above statement, it will be seen that Lallatpur has a fair amount of forest tracts, though they are generally very badly situated for export. Moreover, besides its timber, it possesses copper mines and iron in abundance; *catechu* is also manufactured, and *lac* gathered here; but I am informed that, for some reason for the last two or three years, the catechu-makers have not appeared in these forests

27. The great difficulty in regard to these forests is the revenue, the only forest produce, for which there is a sale, being *bamboos* and *teak*; and nothing can be expected from the *teak* till time has been allowed for it to grow up. But there ought to be some revenue realised from grazing, as I am aware that large herds of cattle come from Ságar, and probably also from the Bhilsa direction to graze here. But except *teak* and bamboos, all the commoner sorts of wood are simply a drug in the market, and there is no sale for them whatever, as the people are terribly impoverished, and the country has been decimated by famine and disease, and there is no single town of even the most moderate pretensions in the District. The scanty wants of the population for wood are met from the village forests and zamindaree estates.

28. Under these circumstances, the revenue has not exceeded Rs. 1,250 hitherto. During the current year it may possibly reach Rs. 2,000; but with every care it is not likely to exceed Rs. 2,500 for some years to come.

29. There is an establishment of Rs. 100 a month allowed for two Darogas, one Jamadar and 14 Watchers. It is thought the Jamadar on Rs. 10 might be spared, which would save Rs. 120 a year, but with such an extent of forest tracts, if any watching is to be done at all, it is impossible to see how the number of watchers can be reduced. If the Jamadar be reduced, the establishment charges would stand at Rs. 1,080 per annum, and if the Budget grant for conservancy be limited to Rs. 1,000 in addition, it is believed that with care the income from the forests may be made to cover the expenditure, and I cannot say that at present I see any reason to allow the expenditure to exceed the revenue as has been the case hitherto.

30. As regards the manner in which the allotment for conservancy should be spent, I would suggest that, as Rs. 1,000 will not go far in the conservancy of 100,000 acres of forest, that attention *should entirely be directed to the conservation of the best patches of teak forest.* To this end broad lines should be cleared and burned round any of such places as seem conveniently situated for protection, so as to prevent the jungle fires spreading into them. The Sioni tract, west of Lallatpur, seemed to me to be particularly well situated for such protection, and perhaps some small tracts in the Dasán Valley may also be selected for similar conservation.

31. But dhya should be suppressed in all Government Forests, and if this is done, and the *teak* generally protected, it is as much (together with the small amount of fire conservancy suggested above), as the Civil Officers can be possibly expected to effect, unless a special Forest Officer be appointed.

General Remarks.

32. Two or three points have been carefully considerd by me in my visit to the Jhansi District, they are—

1*st.*—Whether it is necessary to appoint a Forest Officer to its charge;

2*nd.*—Whether it is necessary to make plantations in the Jalún and Jhansi Districts;

3*rd.*—The general supply of building timber.

33. As regards the appointment of a Forest Officer, there can be no doubt that much progress in Forest Conservancy cannot be expected without one; for it is impossible for the Civil Officers, however willing they may be, to give any attention to distant jungles, where their duties rarely take them. But I cannot say that I think that at present the appointment of an Officer would be attended by any special development of the revenue, and as far as the conservancy is concerned, matters are yet in such an elementary state that it hardly seems as if an Officer could be of much use. But as the *teak* grows up in a few years' time, it may certainly be advisable to appoint a Forest Officer here to look after it, and regulate its sale; and as was originally proposed by me, I would still suggest that after two or three years when the Dún forests, it is to be hoped, may have been put in good order, the extra Officer

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Note by Colonel Davidson, Deputy Commissioner, Lallatpur.—Attention is invited to the monthly returns for current year. Some revenue has been, sometime past, derived from grazing dues; and I think the amount is gradually on the increase, as reported by me in the Settlement Department, the value of these grazing lands, especially in seasons of drought, is very considerable, and through them large numbers of cattle were saved in 1868.

Mowah fruit is also a source of revenue, especially in the Lakanjir tract; but the distance is great in Balabihat: and hence I am inclined to doubt the expediency of doing away with the Jamadar.

I would propose abolishing "Darogahs," and, instead, having three Jamadars on Rs. 15 per mensem each. This would save (if I recollect rightly) Rs. 25 per mensem, and the required object would, I think, be equally well gained. Otherwise I recommend one head-man of some sort for the Balabihat jungles, and one for Lakanjir, leaving the Bansi and Talbihat tracts to the care of watchers only. This might cause some loss of Forest revenue; and I therefore commend to the Conservator's notice my proposal of having a Jamadar on Rs. 15 for each of three Circles. This amount of salary is sufficient, until the revenue materially increases.

The arrangement might be left to the Deputy Commissioner as long as the total was not exceeded.

(Sd) G. F. PEARSON,
Conservator.

sanctioned for the Dún might be removed to Jhansi. The fact is that at present every Officer, whose services can be obtained, would be employed more usefully, and on far more important works elsewhere; and when there seems some hope of realising a better revenue here, an Officer may be, perhaps, spared for the charge. But at the same time I am of opinion that the Lallatpur forests from their situation are not likely to be *ever* very important, as there is so much *teak* in Ságar, and also in Úrcha (Tehri); so that the Lallatpur forests (which are, as it were situated between the two), will probably not be much drawn upon except for local wants which never can be very large.

Secondly.—As regards fuel-plantations in Jalún and Jhansi, of course their establishment would depend entirely on the appointment of an Officer to the charge of the forests of this Division. There can hardly be a doubt that plantations would be a benefit in localities so singularly denuded of all trees as these two Districts are, if it were only to divert the droppings of the cattle to their proper use, as manure to the fields, instead of their being burnt up as fuel. The *babúl* grows vigorously here, and the *sissú* also would grow readily, and I do not know that there need be any practical difficulty in establishing plantations. But the Deputy Commissioner of Jhansi told me, that at present in that District the people do not use all the manure that is available to them, so there seems no urgent demand for fuel-plantations at present on this ground. It is to be hoped, however, that by degrees they may arrive at a sufficient intellectual status to see the benefit of using *all the manure they can get*: and the fact that they do not use it at present, should not perhaps deter us from providing for the possibility of their doing so hereafter, and if *in due course an officer can be spared*, perhaps some plantations should be commenced in these Districts; at present, however, the people will not even give their labor to thin the *babool* plantations made by Mr. Jenkinson, when offered the proceeds of such thinnings in return for their labor.

Thirdly.—As regards a supply of building timber to these Districts, the only wood procurable at present is *sál* purchased at Cawnpúr at Rs. 1-14 per cubic foot, and *mowah*, which is generally used for all public buildings, on account of the great expense of *sál*. But the *mowah* is valuable also for its flower, and should not be cut for timber if other wood were procurable. *Teak* pieces from Úrcha are only procurable of very moderate dimensions, and not larger than from 6 to 9 inches in diameter, and 15 to 20 feet in length. The common timbers in Lallatpur are *saj*, *tendú*, and *huldú*, and these, judging from the beams I saw in the new police guard-house at Lallatpur, are exceedingly indifferent. I would strongly recommend that sometime when the demand in the Kamaon and Garhwal Forests is slack, that a raft of 500 or 1,000 logs of *sál* be sent to Cawnpúr by the Forest Department, and that it should be put up to auction in small lots, full notice being given all over the Jhansi Division, and perhaps a priority of selection at certain prices being given before the auction to persons *bonâ fide* from those Districts. Even if less money was realised to the Forest Department than would be the case by selling the timber at the Forest Depôts, there need be no fear of the price not covering the cost of bringing the timber to Cawnpúr, while the act would be one of great benefit to these Southern Districts of the orth-West Provinces, which are so remote from all timber producing forests.

NOTE.—Since writing the above report, I have heard that *sál* has now become much cheaper at Allahabad and Cawnpúr, probably from the Nipal forests which have been closed for the last two years being opened again. But the above observations were made from information on the spot, and enquiries at Allahabad from the Railway Officers, and at Cawnpúr from natives.

Note by Colonel J. Davidson, Deputy Commissioner of Lallatpur.—Where the rich black soil prevails, the people do not care about manuring their fields; but in the lighter tracts it is different, and the value of the crop greatly depends on the quantity of manure employed. If not required for fuel, it would probably soon be employed for fields near the village sites.

From the Government of India, Public Works Department, to the Secretary to the Government of the North-West Provinces, in the Public Works Department, Forest Branch,—(No. 452F, dated 19th August, 1870.)

I am directed to acknowledge the receipt of your endorsement, No. 140F-C, dated 28th June last, forwarding a Report by the Conservator, on the Forests of the Jhansi Division, with the orders passed thereon by the Government of the North-West Provinces.

2. The area and receipts of these forests in 1868-69 are entered in Major Pearson's Report as follows:—

	Acres.	Rs.
Jalún	4,600	662
Jhansi	23,138	2,485
Lallatpur	100,000	1,250
Total ...	127,738	4,397

From the statement of actuals in the Budgets, the total receipts and charges of the last three years would appear to have been as under:—

	Receipts. Rs.	Charges. Rs.
In 1866-67	5,412	5,262
„ 1867-68	3,859	6,103
„ 1868-69	5,873	8,455

The receipts reported for 1868-69 do not agree with those entered in Major Pearson's Report. The Conservator correctly urges that these forests ought to pay their way, and that no excess expenditure should be permitted

3. In Jaloun, the Northern District, there are no forests, but grass rumnahs or preserves, which Major Pearson thinks should yield a net annual income of about Rs. 1,500. There can be no doubt that it is desirable to encourage the growth of trees in these rumnahs, and they should certainly remain in charge of the Forest Department, as already ordered by His Honor the Lieutenant-Governor. It is supposed that their boundaries are marked out in a clear and unmistakeable manner.

4. In Jhansi, it is gathered from the Report, that the demarcation of the forests has been completed, which is satisfactory. The most important tract appears to be the Babina Forest,* south of Jhansi, on the banks of the Bhetwa River. The *teak* is said to be small, but capable of improvement. Besides *teak*, *bamboos* and *khair (acacia catechu)* appear to be the most valuable products.

* 11,000 acres

Major Pearson does not apparently expect much revenue from the Jhansi forests, the sale of grass and bamboos being almost the only source. But he admits that where the *teak* has been protected, as in some Native States and Zamindaris in the vicinity, building timber of moderate size may be obtained. This is also gathered from Mr Webber's Reports of 1866. He refers to 30 feet solid bamboos produced in Syur near Urcha, and says that with care such bamboos might be produced in the forests in British territory. It seems clear that both *teak* and bamboos might prove remunerative if taken care of, and, as suggested by the Conservator, attempts to exclude fires should be made on a small scale.

5. In Lallatpur, the demarcation has not been completed, the total area of the Government forest lands is estimated at 100,000 acres, containing a considerable proportion of *teak*. The Conservator says, the great difficulty in Lallatpur is the revenue, as *teak* and *bamboos* are the only forest produce for which there is a sale, and he fears that the revenue is not likely to exceed Rs. 2,500 for some years to come, which is a very small figure for the large area.

On the other hand, he admits that good *teak* grows in the valley of the Dásán River, which, as well as the bamboos may be floated down into the Northern Districts where it is much required.

He proposes that attention should be entirely directed to the conservation of the best patches of *teak*. *Bamboo* forests should be included, and though, as a matter of course, certain portions only of these extensive forest tracts will, from time to time, be closed absolutely, and the villagers will be permitted under the rules to cut the inferior kinds of wood, conservancy, as far as the rules provide, should not be given up in any portion of these forests.

6. His Excellency the Governor General in Council has read Major Pearson's Report with great interest. It appears to him that in these dry hills of the Vindhya Range, the vegetation of which has been so well described by the Conservator, the value of Government forests should not be under-rated. Whatever is now done in a really useful manner for the protection and improvement of these lands, so as to encourage the growth of grass, bamboos, and useful trees, will repay itself abundantly in various ways. The attention of His Excellency in Council has been drawn to the rules which are recorded in the Proceedings of the North-West Government for April 1868, Nos. 28 and 33. These rules are not mentioned by Major Pearson, and I am directed to enquire whether they are still in force in the Jhansi and Lallatpur Districts. They seem to provide for an efficient protection of the Government forests.

APPENDIX H.

REPORT ON THE FORESTS OF THE DEHRA DU'N IN THE N. W. PROVINCES.

From G. GREIG, Esq., Officiating Conservator of Forests, North-Western Provinces, to the Secretary to the Government of the North-Western Provinces, Public Works Department, No. 57, dated the 5th April 1871.

I have the honor to forward a report on the Dehra Dún Forests by Dr. King, together with Major Pearson's remarks thereon.

MEMORANDUM ON THE DEHRA DÚN GOVERNMENT FORESTS BY DR. G. KING, ASSISTANT CONSERVATOR.

I.—Contrast between the Dehra Dún and Garhwal Government Forests.

PHYSICAL and natural aspects apart, no contrast could be greater than that presented by the two Government forests, which are divided by the Ganges during its course from the Himalayas to the Siwaliks. The *Dehra Dún Government forests* on the right bank of the river, consist of scattered pieces, separated by ill-defined and doubtful boundaries, from numerous private forests and village grants, and intersected by numberless winding roads and cart tracks, which connect the various villages; while the *Garhwal Division* forms one undivided well-defined block, broken up by very little cultivation, and by not an acre of private forest, and penetrated by well-defined roads leading from the chief sources of forest produce to the plains. In the Dehra forests, cattle are allowed to stray wherever they can find grass. In Garhwal, grazing is confined to the grassy flats along the margin of the road which forms the southern boundary of the Division, and separates it from Bijnaur. The Dún has a large consumption of forest produce within its own limits in numerous villages, and in the stations of Dehra and Masúri; Garhwal has none. The Dún has numerous outlets for its produce, notably the rivers Jumna and Ganges, and the two great roads leading *viá* Mohan and Timli from Masúri and Chakratta to the plains, besides eleven passes of various degrees of practicability through the Siwaliks; Garhwal has but few main exits; these are the river Ganges and the smaller stream the Ramgunga (by which only light articles can be floated), and the roads leading to Najibabad and Azzaffghar. The markets for Dehra produce are both near and numerous, and the railway is within 45 miles; while the markets of that of Garhwal are distant, and the railway far off. In Garhwal, the only proprietor is Government, and the only levier of duty on forest exports is the Forest Department; in Dehra nearly every one of about 100 grantees or landholders is either himself an exporter, or a levier of duty on the exports of contractors and others. In Garhwal only what trees the Forest Officer permits may be cut; in Dehra each Zamindars cuts in his own forest whatever he chooses, and nearly every one of them cuts, in the most reckless way, the very kind of timber, *viz.*, *sâl*, which it is the chief effort of the Forest Department to conserve in Government forests. In Garhwal the strength of the Forest Department can be, and is, concentrated on the chawkis stationed at the different outlets from the forests, and mostly on the boundary road. Anything contraband of export must pass these; and, if it be there confiscated, the smuggler has no encouragement again to cut such an article. An elaborate system of chawkidari in the forests themselves is, therefore, needless. The strength of the Dún establishment, on the other hand, must necessarily be distributed all over the forests, and efforts must be made to *prevent* illicit cutting in them, as articles once cut and removed to a road cannot easily be detained, although there be the strongest presumption that they are stolen.

In the Dún, it will not do to wait until such articles reach the channels of exit from the Division, and trust to confiscating them *there*, as is done in Garhwal; for by these very channels there daily pass from private forests, quantities of produce of the same kinds as are (on payment of dues) allowed to be taken out from Government forests, as well as *sâl* and other timber, which is entirely prohibited from the latter. A thief or smuggler from Government forests has, therefore, only to declare his stolen or smuggled goods to be the produce of some private jungle, and the Forest Official must allow them to pass, as he cannot legally detain them on suspicion, however strong.

II.—Collection of Revenue in Garhwal and the Dún.

2. In both Divisions the cutting (by exporters) of green timber of any kind* is prohibited, and in both Divisions alike, minor forest produce is the great source of ordinary revenue; but, owing to the different conditions of the Divisions, as just pointed out, the mode of collecting revenue differs.

3. For the removal of minor produce, the Garhwal forests are open to exporters without let or hindrance. For conservancy purposes there is, it is true, a small staff of rangers patrolling the jungles, whose duty it is to prevent wanton destruction and to keep down fires; but the exporters

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* In Garhwal, *khair* chúrans (*i. e.*, pestle used in sugar-mills and made of catechu wood) are permitted to be taken out by purchasers.

of minor produce are allowed to enter the forests and to remove such produce, the Government duty being levied on it as it passes the chawkis at the points of exit from the forests, the moharir stationed at which gives passes. The Forest Officer trusts to the Native establishment at each chawki to collect revenue upon all lawful exports, and to detain all illicit ones. A second, or check establishment is, however, kept patrolling below the boundary road to collect from the exporters, as they go towards the plains, the passes obtained at the chawkis, to check their exports by these passes, and to detain anything in excess of them or anything that may have run the blockade above, and escaped without a pass at all. The passes thus collected are returned to the head office, and are there compared with the returns received direct from the chawkis, and the check establishment receives a good reward for all illicit exports they may seize.

4. In the Dún, a double system of collection prevails. Persons wishing to remove forest produce *in quantity* must first deposit the Government duty at the head office in Dehra, and take out a permit to enter the forest and remove it. Upon the permit thus obtained are entered the name of the particular part of the forest in which the produce is to be cut, the chawki through which it is to be passed, and the time allowed for removal. An order is usually written on the back of the permit giving directions to one of the patrol establishment to see that the produce is really removed from the prescribed place.

Each permit is deposited by the exporter with the name of the moharir of the chawki entered on it, and it is the moharir's duty to see that no more is taken out than the permit allows, and that the time allowed for removal is not exceeded. On the removal of the whole of the produce, the permit is returned to the head office. It would be obviously impracticable to insist on permits being taken from the head office for *trifling exports*, amounting in value to an anna or two, such as head-loads of grass, bamboos, &c., &c. For the removal of such things, people are, therefore, allowed freely to enter the forests (as in Garhwal), and on passing out any produce to pay the duty on it to the nearest moharir or patrol, who is authorised to give a pass or receipt. The moharirs and patrols are supposed to prevent anything from passing without payment, and to forward all their collections at stated intervals to the head office.

III.—Mode in which Exports are made from Private Forests in the Dún.

5. This is three-fold :—1*st*, the zamindar or grantee cuts and removes timber, &c., from his own forest, passing it out on his own rawana to a road or river ghât; where he sells it; 2*nd*, the zamindar or grantee permits a wood-merchant to enter his forest and to remove timber, which is passed out on a rawana granted by the former; 3*rd*, the zamindar or grantee, leases his forest to a contractor (thikidar) for one or more years, under certain reservations, and the latter himself grants rawanas for the timber removed.*

In all three ways Government is liable to be robbed, as will be shown below.

6. The rawana, which accompanies all exports, is a pass, on which is entered particulars as to the forest where the article exported was cut, the name of the proprietor or lessee of the forests, a description of the article and of its value, the buyer's name and address, the mode of transport, and the Government forest (chawki) through which it will pass. The custom of giving a rawana appears first to have been devised as a protection to the buyer in case of his wood being challenged in its passage through districts outside the Dún. It is now a regular institution, and no man will buy wood without a rawana.

7. With a view of exercising some control over the exports from the Eastern Dún, and of learning what was doing in private forests, so as to be able to put a stop to malpractices, the officer lately in charge of the Division (Mr. Colvin), got all exporters to agree to send their rawana to the Forest Office for counter-signature by the Forest Officer before sending out their goods. On the back of the rawanas thus presented, it was, and is still, the custom for the Forest Officer, if he has any suspicion about the rawana, to write an order to the Native Forest Official in whose district the forest lies whence the goods profess to be taken, to inspect the said forests, and if on inspection the goods agree with the rawana, and have apparently been cut there, to let them pass, but if not, to report the fact and detain them for enquiry. All zamindarce rawanas were, and continue to be, collected at the various Government forest chawkis on the roads leading from the Dún, the moharirs at which have orders to check the goods by the rawanah as they pass out, to detain anything not in accordance with it, and in all cases to note on the back of the rawana the date of the goods passing out, and to return it to the head office in the same way as the Forest-Office permits are returned. If worked by a faithful establishment, such an arrangement would be highly useful; and, with certain safeguards, a legalised modification of it is one of the reforms I would propose in the future management of the Division. It is obvious, however, that in its present form it is an arrangement liable to great abuse by a corrupt amla; and as a fact, it has been greatly abused.

IV.—Modes in which stealing and loss of Forest Revenue occur.

These are various. From the nature of the Division, as above described, stealing from the Garhwal forest without the knowledge and connivance of the Forest officials is (except on the banks of the Ganges), I believe, too difficult to be of very frequent occurrence. I believe, however, that during the rainy season, when to any, but themselves, entering the forests is simple death, the Boksa'st

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* In cutting timber in their own forests, private proprietors make no exception in favor of *sál*; on the contrary being the most valuable kind of wood, it is the chief article of their export. The only attempt at conservancy they make is sometimes to reserve trees under 9 to 12 inches in girth—a provision utterly insufficient to ensure a supply for the future. The Native proprietor, as usual, looks only to a present good, and in many cases in the Dún he has cut literally everything that would stand up to the axe. The extinction of *sál* in private forests in the Dún is, therefore, merely a question of time, and Government will one day be the only owner of *sál* forests in the Division

† An aboriginal tribe inhabiting the Bhabur.

go into the valleys and ring *sâl* trees, with the view of exporting them during the succeeding cold season as dead timber, at a low price. Embezzlement of revenue by the Native officials is probably but little practised. The check establishment and the vigilance of the Forest Officer are, I believe, sufficient to prevent this being carried on to any very great extent. If, however, purchasers should be allowed themselves to cut and remove timber, stealing and embezzlement would both become easier.

9. In the Dehra Dún Division, Government suffers loss in three ways: *first* and chiefly, by *stealing*,—(*a*) zamindars, lessees of zamindaree forests, and others cut timber, &c., in Government jungles and pass it out as the produce of private forests, either unknown to the Forest officials, or with their assistance and connivance,—(*b*) the Forest officials themselves steal wood from the districts under their charge, and sell it; *second*, by embezzlement on the part of the Forest officials of the revenue collected by them on minor forest produce; *third*, by produce being passed out in excess of the permits, or by permits being used twice. To show that these losses are not merely theoretical, I may mention a few among many instances which I have discovered since taking charge of the Division in February 1870. As illustrations of the first, I may mention that, in the early part of the year 1869, a few zamindars of the Eastern Dún, together with some wood contractors, took permits from the Forest Office to cut in the Government forest 1,700 scores of *sein* kurris. Instead, however, of that number, they cut about 4,300 scores, and exported the difference (2,600 scores), on false rawana's as the produce of private forests. This was done with the connivance of the Native officials *who shared in the plunder*. By these means Government was robbed of timber to the value (counted at Rs. 10 a score) of Rs. 26,000. Some of the chief offenders are now under trial for these doings, but, owing to the length of time that has elapsed since the theft, it is necessarily difficult to furnish proof sufficient for a Court of Justice, though there is not the slightest moral doubt as to who the thieves were, and what they stole. I have information of another case which happened a year or two ago, where about 1,400 *sâl* trees of large size for the Dún were illicitly cut in the forests leased by Government from the Tehri Rajah, and exported without paying a farthing of duty. Cases of embezzlement have come to light in abundance. The late moharir of one chawki is now undergoing sentence of imprisonment for a crime of this sort. In the Sub-Siwalik forests, in March last, I myself counted the stumps of many hundred *sâl* trees which had been cut and converted into charcoal, while the revenue derived from charcoal from the three or four nearest chawkis for the entire season, amounted to only a few rupees.

V.—Government Forests in the Dún.

10. In order properly to understand the difficulties that surround the suppression of these illicit practices, it will be necessary to consider the situation of the various blocks that constitute the Government forests in the Dún, and also those that belong to zamindars. For the better understanding of this, I append a map in which the Government forests are colored green. The map professes to be only *approximately* correct. The Malkot forest, being still in the hands of the Civil authorities, is not colored, and the leased forests of Tehri are indicated by name in black ink.

11. The Government forests divide themselves into four sets:—

The Forests of the Eastern Dún.	The Forests of the Siwaliks.
,, Western Dún.	Forests leased from the Rajah of Tehri.

12. *Forests of the Eastern Dún*.—The chief of these are marginally noted. The timber in them consists now chiefly of small *sâl*. The heavier *sâl* which (as old stumps show), once existed, had been cut before Government instituted any measures of conservancy whatever. When first introduced, these measures extended only to *sâl*; and the second-rate kind of timber having been unpreserved until very lately were freely cut, and are now comparatively scarce. The grants or village allotments in the Eastern Dún, *as now defined*, exceed in area the Government forests. At the time Brown's maps were made, the line dividing the Dún into Eastern and Western, ran close under the Nagsid Hill, whereas the present boundary (the Saharanpur road), is farther west. The space contained between these two lines consists entirely of zamindaree land, mostly cultivated. The list contained in Appendix A gives the areas *of all the villages and forests in the Eastern Dún* of Major Brown's time, but contains no record of the area falling between the old and new boundaries, nor of any villages that may have been formed since his survey. The timber distributed over these different allotments is similar in character to that contained in the forests belonging to Government, but the *sâl* is not so fine. There is probably not one of the villages mentioned in the Appendix that has not on its waste land a *patch of "jungle" of some sort*, although in many cases it is mere scrub; many of these village jungles (specially where a Government forest is near), are kept up solely for appearance sake, so that *it can be said that the village possesses a forest*, and that stealing may be facilitated. The stealing is managed in this wise: a few trees are cut in the village forest, and a great many in the nearest Government one. These are all taken out as *bonâ fide* the produce of the village allotment on a zamindar's rawana. The Forest Officer sees the wood being taken out, and, if suspicious, he visits the village whence it is said to have come. He finds a few stumps in the village jungle, and is satisfied that some cutting has taken place there. In the neighbouring Government forest, he also finds a number of stumps, but these have, probably as a blind, been all blackened by fire, and he cannot determine when they were cut. He is perfectly sure that there is roguery; but, being unable to prove it, he must let all the wood pass. This is no imaginary case, for a very notable example of it occurred to myself in May last, in the village forest of Birkot, from which (calculating from the stumps), about 40 scores of kurris might have been taken, whereas 192 scores were lying at a ghât on the Ganges, professedly the produce of this forest.

Nagsid Hill, Nawada Mothrawalla.
Bûlawalla.
Siori (Kansrao).
Motichûr.
Birpur.
Tirsak { Forests of Gosiwalla, Bangala, and Rambawali Naddis.
Jogiwalla.
Thanû.
Malkot.
Sankot. { Held from the Tehri Rajah by a special arrangement.

13. A glance at the map will show that the bank of the Ganges in the Eastern Dún is almost entirely occupied by grants and villages. These have all pieces of forest of greater or less extent attached, and, disguised as exports from them, large quantities of timber stolen from the Government forest behind, are sent off by the river, which gives great facilities for its rapid removal. A glance at the map will also show to what an extent the Government forests are intersected by private ones, from which exports are being actively carried on. It is unnecessary to add more as to the difficulties which this throws in the way of conservancy and collection of revenue in the former.

14. *Forests leased from the Rajah of Tehri.*—By the terms of the lease executed in 1866, all the forests in the Tehri territory, other than private, are made over to Government for 20 years, during which period Government is at liberty to take what measures it pleases for conservancy and for cutting. The Tehri boundary from the Jumna to the hill called Tobtiba, east of Landaur, is the water-shed or sky line of the outer range, *i. e.*, that on which Masúri and Landaur stand. To the east of Tobtiba the boundary bends down, and approaches the plains, and for the six or eight miles nearest the Ganges it is quite on the plains. The wording of the lease is vague, and I have heard that it gives more than was intended. This point ought, however, either not to be raised at all, or it ought to be definitely settled.* No measures have yet been taken by the Dehra Office for the conservancy of any of the Tehri forests except those of Sankot, nor has it been properly settled what forests came within the province of the Dún Officer. Permits have, indeed, been granted by the Dún Office to cut timber in that part of the Tehri forest bordering on Rikikhes and in the forest of Sankot, and a good deal of revenue has been realised from this source. Much of the Tehri forest lying along the lower slopes of the Himalayas bordering on the Eastern Dún appears valuable; and, as timber goes on rising in price, it will be well worth working. There is a good deal of *sâl* in it, and also rather heavy *bankli (Conocarpus latifolia)*, and *daura (Lagerstrœmia parviflora)*, both excellent timber trees, and in these days fetching a high price in the market. The forest now alluded to is worthy of careful inspection, and some arrangement should certainly be made to get revenue from it, and to preserve it from the rapacity of the zamindars of the Dún villages bordering on it, who have not only been cutting largely in it, but have also extended the boundaries of their villages at its expense.† With the exception just mentioned, no revenue is derived by the Dehra Office from this forest.

15. The stations of Masúri and Landaur, though within the Dún boundary, may be best considered under the present heading. Large quantities of sawn timber, and (during the season), innumerable loads of fire-wood, charcoal, &c., are daily brought into them from the Tehri territory. These pay no duty to the Forest Department, although the right to levy duty seems clear, unless, indeed, these articles be the produce of private forests in Tehri, which it is improbable all are. The propriety of establishing forest chawkis round these stations (during the hot and rainy seasons at any rate), is, therefore, a matter for consideration, and undoubtedly a good deal of revenue could be raised by these means.

16. Measures of conservancy are much wanted near Masúri. The few trees that still remain are rapidly being felled for fire-wood; and, as a matter of course, none are being planted to replace them, so that the complete disappearance of timber near the station is only a question of time

17. *Government Forests in the Western Dún.*—The only recognised forests left to Government here are those of Dholkot, Chandpur, and Umbari. These consist of young *sâl*, some of which are very fine and healthy. The Dún boundary here extends to the sky-line of the outer range of the Himalayas (the range on which Masúri and Landaur stand), the slopes and valleys of which are in places covered with very fair timber. The whole extent of these slopes *is said* to belong to zamindars, but I am inclined to think that a careful examination of the records in the Collector's office would probably prove that a good deal of the forest here really belongs to Government. I think this matter is worth looking to, for the timber on these slopes, valuable now, will one day become much more so.

18. The private forests on the plains of the Western Dún are not extensive. They lie near the base of the hills, and chiefly near Rajpur. Although most of the level ground in the Western Dún has been cleared of timber, *very little of it indeed has been brought under cultivation*, and this district offers an excellent illustration of the effects of ruthless, wholesale clearing of timber. The forest having been cut, the natural moisture of the soil has gone from it for ever, and most of the area being too high for irrigation, it remains uncultivated. As is invariably the case, *the virgin forest, when once entirely cut, has not been succeeded by forest*, but by grass and scrub; and grass and scrub *are likely to remain masters for a long time to come.* The Western Dún forests have suffered much from wood-stealers.

19. *Sewalik and Sub-Sewalik Forests.*—With the exception of one village near the Jumna and of a grant near Asaraori, the entire Sewalik, from the Jumna to the Ganes, forms an unbroken Government forest, which may average six miles in breadth ‡ The Sewalik does not consist of a single ridge of hills sloping towards the Saharanpur District on the south, and towards the Dún on the north side, but of a series of small ridges more or less parallel to each other, and often at right angles to the main chain. Formed of soft tertiary and recent deposits, which yield easily to the action of the weather, the range is remarkable for its precipitous character, and is also extremely dry.

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* If these forests are really given by the present lease, Government ought undoubtedly to require them.

† The boundaries of the villages of Kaldar, Kowlsi, and Phagsi have, in my opinion, been extended far beyond the limits laid down in either Brown's or the Patwari's maps. They have been extended into forests which I understand Government to have leased from the Rajah of Tehri. I believe other villagers have done this kind of thing too, and that a careful examination would bring to light much iniquity of this sort.

‡ The length being 48 miles.*

20. The boundary between this forest and the Saharanpur District wants very careful examination. Until recently, Government owned pieces of forest running far down into the Saharanpur District; while, on the other hand, there were villages and cultivated patches within the Siwaliks. Mr. F. Williams, as Commissioner and Conservator, with the view of consolidating the Government forest and straightening its boundary, induced the zamindars holding lands in the Siwaliks, and above a certain line which he fixed upon as his forest boundary, to agree to give up such lands in exchange for pieces of forest running down into the Saharanpur District. Of these exchanges, however, the Dehra Forest Office *possesses no information*, and I am convinced that there is a good deal of land south of the recognised forest boundary still belonging to Government, of which the Dehra Forest Office is unaware, and of which the Saharanpur Collectorate probably takes no note. This matter deserves immediate attention.

21. On the northern slopes of the Siwaliks, the timber is chiefly *sâl*; on the southern slopes and on the plains at the base of the range, it consists of *sâl* mixed with inferior kinds of timber, such as (1) *baheria*, (2) *jingan* (3) *karpat*, (4) *bael*, (5) *pulli*, (6) *bankli*, (7) *padal*, (8) *shisham*, (9) *sandan*, (10) *khair*, and other trees characteristic of dry districts, with (11) *chir*, in the higher grounds, and bamboo towards the eastern end of the range.*

22. The most valuable parts of this forest are, in my opinion, the most northern slopes, *i. e.*, those which run into the Dún. These are covered with *sâl*, nowhere heavy, but in some places very vigorous and promising. This tract of *sâl* is exposed to the pilfering of the inhabitants of the Dún villages lying between it and the southern bank of the Asan. A good deal of timber is stolen and carried southward through the eleven passes before alluded to, as well as by the two high roads, and by the rivers Jumna and Ganges. Thieving wood-merchants from the Saharanpur District also come up these passes, bringing pack-bullocks with them, cut small trees of *sâl* and of *khair* wood, and make their way back without discovery, often by night. A good deal of this might be put a stop to by rendering the passes impassable for laden bullocks, and by more efficient patrol establishments on the boundary between the forest and the Saharanpur zillah.

23. The Sub-Siwalik forest (*i. e.*, the south aspect of the range, and the plain immediately at its base), being quite open towards the Saharanpur District, affords great facilities for stealing. Being far from the head office, what revenue is derived from it is chiefly collected directly by the native officials stationed in it, as people do not care to come to Dehra to take out permits from the head office. It is in this part of the forest that both stealing and embezzlement have been most rampant and wide-spread. Here whole vallies have been cleared of their timber, and Government has received the merest pittance in the shape of revenue. Appointments in this part of the Division are coveted above all others, because they afford such opportunities for pillage and bribery. I fear all attempts to collect revenue by direct agency in this forest will be failures, and in my opinion much more revenue could be taken out of it by giving it out in leases for grass, bamboos, and minor forest produce only, *reserving all timber*, and keeping up an establishment of patrols under an active Overseer to prevent the removal of articles not included in the lease.

VI.—Boundaries of the Government Forests.

24. As the forests in this Division have not as yet been regularly taken up by proclamation, or by announcement in the *Gazette*, the speedy demarcation of boundaries, in order that this may be done, is a matter of the most pressing importance.

A very complete survey of the Dún was made in the year 1839 by Major Brown. His maps (deposited in the Dehra Collectorate), have been the basis of the subsequent settlements made by Mr. Ross and Mr. Daniell, and as they give the areas not only of the villages, but of the forests, they are of the greatest value. A survey by the Forest Department has also been going on for some time, and the map is now nearly ready. Mr. Williams (the late Conservator of Forests and Commissioner of the Division), by whom this forest survey was begun, made extensive alterations in the forest boundaries by way of straightening them. This he managed chiefly by effecting exchanges with grantees and zamindars whose lands adjoined the forest. In the Western Dún these changes may be considered as complete,† boundary lines having been cut, and in many places pillars erected. The sanction of Government is still, however, wanting to make these new lines *boundaries*. In the Sub-Siwalik forest, where many exchanges have been made with zamindars in the Saharanpur District, the boundaries are, *at least as far as the Dehra Office is concerned*, in a very unsettled state, and want careful examination.

25. In the Eastern Dún, Mr. Williams only partially carried out his scheme of straightening boundaries; and even the lines which he did actually clear, intending that they should become the new boundaries, have in many cases become over-grown with forest. In no part of the Eastern Dún have forest boundary pillars been erected. This district may, therefore, be considered as for the most part untouched in the matter of boundaries. Actual cases which have come under my own notice since I took charge of the Division, make it highly probable to me that many of the zamindars and native grantees in the Eastern Dún have extended their village limits at the expense of neighbouring Government land, which ought now to belong to the Forest Department. The maps at

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* 1. Baheria (*Terminalia bellerica.*)
2. Jingan (*Odina wodier.*)
3. Karpat (*Garuga pinata.*)
4. Bael (*Ægle Marmelos.*)
5. Pulli (*Kydia calycina.*)
6. Bankli (*Conocarpus Latifolia.*)
7. Padal (*Stereospermum suaveolens.*)
8. Shisham (*Dalbergia sissoo.*)
9. Sandan (*Dalbergia.*)
10. Khair (*Acacia catechu.*)
11. Chir (*Pinus longifolia.*)

† There are still two cases of disputed boundaries in the Western Dún, but they are of old date, and originated before a Forest Department existed. Both of these, Mr. Vansittart's and Mr. Mackinnon's, are now in course of settlement.

present in the hands of the putwaris are of the roughest description ; they do not give the areas of the villages ; and, provided the shape of a village be retained, its boundaries can be extended without much fear of detection. Brown's maps, on the contrary, have the areas accurately marked ; they are the basis of the putwari's maps which were drawn up by Natives at the last (Mr. Daniell's) settlement. Mr. Daniell in many cases curtailed the forest land of villages, and in such cases the putwari's maps, of course, differ from Brown's.

26. The only true way to fix the forest boundaries in the Eastern Dún is undoubtedly to investigate the claims of all zamindars and grantees in it to hold the forest, which they do, *by computing the areas of the various villages* as laid down in Brown's maps *in all cases where the present putwari's maps profess to agree with these*, and to consider all the land not included in villages or grants as Government forest, arranging, of course, the boundaries of all grants made, and villages formed *since Brown's survey* on their own basis. Straightening of boundaries can be easily managed afterwards if it be considered desirable; but in my opinion it would be better for Government *first to know what its own property amounts to*, before altering any boundaries. Until this is done, and the forest map is finished, the efforts of the Executive Officer in charge of the Division to hold his own against thieves will continue to be unavailing. It is, I think, probable that the computation of village areas now proposed would show that villages within the Dún have been largely extended at the expense of Government forests, and those bordering upon Tehri have been increased at the expense of forests leased from that State.

VII.—Grazing Dues.

27. Doubts have, I believe, been raised as to the right of the Forest Department to levy these, inasmuch as the inhabitants of the district can plead right of usage to graze their cattle free, in the forests outside their villages. I have not sufficient knowledge of the matter to form an opinion, but I believe they can also plead the right of usage to cut what timber they choose in the same forests, as in former days they did so without let or hindrance, and without payment. It might, therefore, be as well not to raise the former question, especially as grazing dues are paid without any reluctance and as a matter of course.

28. The revenue from this source (at present about Rs. 3,000 a year), might be much increased, the current rates* being very low. A better mode of collection would also prevent a good deal of embezzlement which has hitherto gone on in this item of revenue.

VIII.—Revenue, and modes of increasing it.

29. The revenue for the year 1869-70 (derived, as in Garhwal, chiefly from minor produce), amounted to Rs. 40,229. During the year a large amount of produce undoubtedly left the Government Forests, on which the Forest Office realised no revenue ; indeed, this has been amply proved during the course of recent criminal prosecutions. The hope must not, however, be indulged that, although all bribery and embezzlement were to be stopped during 1870-71 (which, by the way, is highly improbable), the collections for 1870-71 would exceed those of 1869-70 by anything like the value of the produce stolen during the latter year, and chiefly for this reason, that much of the stolen produce (young trees, &c.), would have been of a kind which the Forest Department does not allow to be cut. The Government Forests would, however, remain so much the more valuable at the end of 1870-71, inasmuch as they would contain so much timber that would have been stolen. In estimating the amount of loss inflicted when young timber is cut, it must, of course, be borne in mind that a tree stolen *now*, of which the value might be one rupee, would (had it been allowed to grow), in ten or twelve years have become worth two rupees.

30. The Dún revenue might however, be immediately increased, without any interference with true conservancy by—(1) the adoption of a different mode of collecting revenue, and by sharp supervision, (2) by supplying the Canal Department with all the small timber used annually in headworks, &c. ; and (3) by looking after the revenue of the Tehri leased forests above referred to. . As these Tehri forests appear to contain a good deal of mature *bankli*, *daura* and *sein*, and some fine bamboos, I consider this the chief source to be looked to for immediate increase of revenue. Without, however, the adoption of some plan similar to those to be detailed in the next paragraph, it will, I believe, be impossible to work the Dún forests, so as to take all possible revenue out of them.

31. As to the mode of collecting revenue, I do not think the plan of *direct collection of minor revenue* at all suitable for this Division. Theoretically it may be the best, but experience has shown that practically it has the double disadvantage of being both expensive and inefficient. In my opinion the system of leases should be tried. Where there is no dispute about boundaries, as in the Western Dún and part of the Siwalik forests, this plan might be begun at once. In other parts the boundaries would require to be properly settled before attempting it. The leases should be for minor produce only, for short terms and for well-defined and not too extensive districts; and two districts should not be leased to one person

32. As has just been mentioned, the Canal and other Departments might be supplied with small timber, and cutting might be conducted in the leased Tehri forests. *Khair* churans (for which as long as the present style of sugar-mill continues to be used, there will be a steady demand) might also be cut for sale. But any *timber cutting* should be carried on by *direct agency of the Forest Department.* The timber so cut need not be sawn up, but merely removed in the rough, *well out of the forests*, and laid down at convenient spots where purchasers could take it over. *On no account should timber buyers be allowed themselves to cut in Government forests*, for even although the trees made over to them were to be marked by the Forest Department, opportunity would again be offered for a repetition of the abuses of the past.

33 In carrying out the lease system, a smaller (or at least a less expensive) native establishment would be required. Moharirs would hardly be wanted, but a strong force of patrols to look

* Three annas a year for a buffalo, and one anna for a cow or bullock.

after the various leases, and a few well paid jamadars to look after both, would be necessary. Without, however, efficient European supervision, any attempts at reforms in the way above indicated must be vain. Let there be appointed two active young Sub-Assistants* well up in the language and in knowledge of natives, who shall make it their business continually to move about in the forests in a sudden way *without an amla*, and without advertising their movements, and whose duty it shall be to superintend the doings of the native establishment and of the lessees, *and the conservancy of the Dún Forests; and their protection from thieves will become* a possibility. The annual pay of both these officers would, I believe, be made up to Government in the amount of villainy which they would be able to prevent during *even two months* of the working season. It must not be forgotten that the Dún timber, if treated on principles of true conservancy, must be protected for the present, in order that it may be worked in the future. Present revenue is only one consideration, if the question be how to secure to the State the greatest amount of good from these forests.

34. One very great advantage of the lease system would be the relief of the Executive Officer from the load of vernacular office work with which he is at present burdened. At present the greater part of his time and attention is taken up with a mass of vernacular correspondence, which is no better than *pottering*. Freed from it, he could be a great deal more in the forest, himself directing operations; and, by his very presence, he would keep the native establishment up to their work, and be a terror to thieving zamindars and wood-dealers. With an Executive Officer thus free, and two European Sub-Assistants to help him, I believe the Dún Forests could be profitably managed, and that stealing both in them and along the Garhwal (east bank of the Ganges), could be almost entirely prevented.

IX.—Reforms for the carrying out of which the sanction of Government is necessary.

35. The arrangement which it appears to me would best protect the interests of Government, and of all honest zamindars and grantees in the Eastern† Dún, would be for Government to lease the whole of the forests belonging to both the latter, leaving to each village grazing-ground in the forest near it, and right to cut timber for *bonâ fide* village use, but not permitting any *export*. The whole of the forests in the Eastern Dún and Eastern Siwaliks would then form a single block, and the cheap and effectual system of revenue collections current in Garhwal might then be adopted. I am quite convinced this plan would be by far the most profitable one for Government, and in the end would prove most satisfactory to the zamindars, who would get certain, in place of uncertain, returns from their forests. I think leases of these forests could, with a little tact, be got without difficulty, and on easy terms, for after all it is the native lessees who have chiefly made money by the Dún forests, and not the zamindars or grantees. In fact, the principal monied men in the district have become rich by wood contracts.

36. The health of the Dún would not be affected by this measure, for the extent of land under forest would not be increased, and the Forest Department could easily drain the swampy places from which the Eastern Dún gets its reputation for unhealthiness. Cultivation would not be affected in any way whatever, nor need the breaking in of new land for cultivation in suitable localities be given up. In fact, everything would remain as at present, except that duty on forest produce would be levied by Government instead of by private parties. Were this plan adopted for the Eastern Dún and Siwaliks, the Western Dún and Siwaliks could be given out to lessees.

37. If this suggestion be not approved, some arrangement will be absolutely necessary to make it legal for the Forest Officer to compel zamindars and grantees to give notice to him whenever cutting operations are about to be begun in their forests; to declare the quantity and kind of timber about to be cut and removed; to mark all their timber, and to register their marks in the Forest Office; to give rawanas with all exports, giving full details as to purchasers, &c, and to send a duplicate of each timber rawana to the Forest Office a certain number of days before the produce leaves the forest where it was cut, so that the Forest Officer may be able to inspect it before removal; and finally, to empower the Forest Officer to detain all articles going out of the district without a rawana. These proposals would not practically be so vexatious as they seem, for probably only three or four sales of timber take place in a year from many of the private forests, and the proposals do not extend to minor forest produce, which is taken out daily and in small quantities.

X.—Proposals to clear the Dún, and to abandon it as a Forest.

38. From what has been said of the difficulties of managing the Dún Forests, it might be concluded that they are greater than any possible advantages, and that the better way would be to clear and cultivate those that are culturable, and to sell the remainder. In this view I cannot agree.

It is quite true that the Dún Forests do not now, and never can, yield first-class timber, such as is wanted for large beams, and that Government never can hope to draw from them supplies of the long scantlings required for roofing public buildings; but, apart from the Government demand for long and heavy timber, there is comparatively little from other quarters, while for the small scantling, such as the Dún Forests yield, and which are universally used in Native houses, there is a steady and increasing demand.

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* There is *one* such in the division now, so only another would be required.

† The forests remaining to Government in the Western Dún being so small, it is not proposed to extend the arrangement to that district.

39. To ensure for the people a lasting supply of building timber is, I conceive, as much an object of the Forest Department as to meet the wants of the Public Works Department, and such a supply *is undoubtedly a surer source of revenue.* The Dún at present yields a large proportion of the building timber used *by the people of the North-Western Provinces and Lower Punjab*, and my knowledge of the Garhwal and Kamaon Forests leads me to think that these divisions would not long be able to supply all that would be wanted from them were the Dún cleared. In short I do not think that the Dún could be spared as a source of timber supply.

40. In considering the question of TIMBER *versus* GRAIN, it should not be forgotten that grain can be grown almost anywhere,* whereas *sâl* timber cannot; that the Dún now contains large natural forests of *sâl*, and that should these once be cleared, it would be most difficult and costly, not to say impossible, in the day of need, which would I believe shortly arise, for Government *by artificial means* to reproduce similar forests, in the Dún, or to plant such elsewhere.

41. It has been urged that were the Dún cleared, grain enough might be grown in it for the wants of the district itself, and of the stations of Landaur and Masúri. The probability of this I altogether deny, even were cultivators settled in the district by force and made to till it by compulsion, and for these reasons, that the soil of the greater part of the Dún is poor in the extreme, and a large area of it is incapable of canal irrigation, while, from the depth of water from the surface, watering by wells is impossible. The Western Dún belongs, as has been already said, almost entirely to private parties, and has been largely cleared of its timber. There have been for years, and there are now immense uncultivated tracts of grass (see Section V) which could easily be ploughed and broken up.

A varied proprietary is interested in the utilisation of these, and yet they remain uncultivated which, were the prospects of cultivation encouraging, would hardly be the case. The soil of much of the Eastern Dún is considerably poorer than that of the Western. Were, however, the proposal to clear the Eastern Dún sanctioned, crowds of men would doubtless come forward and offer to settle. This they would do *for the sake of the timber on the land*, which, were the practice obtaining in the Garhwal and Kamaon Bhabur to be followed, would be given with the land as a bait to settlers. This timber once cut, and the proceeds realised, I feel quite sure that (the timber having been the real attraction) the settlers would gradually betake themselves to other regions. But it may be said Government might cut the timber before making over the land to settlers. In that case there would be great difficulty in getting settlers.

42. If the matter be considered in the light of revenue, the undesirability of clearing will become still more apparent. No one at all acquainted with the Dún will maintain for a moment that forest is not infinitely more profitable to the proprietor than cultivated land. I have consulted many zamindars and found them unanimous upon this point. The usual land-rent received from newly-taken-up soil is from 2 to 6 annas a biga. Now, a biga fairly covered with *sâl* of the ordinary size found in the Dún would support at a low estimate about forty trees of various ages. Even at the present prices of timber (and rates are daily rising), an average *sâl* tree, say 2 or 2½ feet in girth, would fetch standing *in the forest*, at the lowest estimate, *say one rupee.* Were only one such tree cut on a biga per annum, a steady revenue of a rupee a biga could be kept up for thirty years, and, at the end of that period, the forest would be quite as valuable as at the commencement, and, from increased prices, probably much more so. But from timber alone much more than a rupee a biga could be realised, not to mention the receipts from grazing dues, sale of grass, bamboos, &c.

GEORGE KING,

Asst. Conservator of Forests.

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* The late Mr. Edmondstone, Lieutenant-Governor of the North-Western Provinces, gave expression to this view somewhere in a printed report, to which I am sorry I cannot give a reference.

APPENDIX A.

List of Villages and Forests in the Eastern Dún, showing their areas in Acres, as laid down in Major Brown's maps, contained in the Office of the Superintendent, Dehra Dún Survey in 1839.

Name of Villages.	Total area in Acres.	Cultivation in Acres.
Endeavour Farm	977	29
Haripur, Khúrd	52	3
Ditto, Kulân	184	86
Hansúwalla	165	55
Nagal	25	22
Nagla	103	35
Forest of Nawada	22,432	
Malkot (the forest is at present under the Civil authority)	21,277	852
Forest of Mothrawalla	10,905	...
Majarí	57	26
Markham Grant	5,861	48
Lachiwalla	275	61
Forest of Goseinwalla	2,964	...
Ganges Khadir	2,036	...
Gohrí	632	22
Garhí	313	113
Gohra	20	...
Gudúj	5,760	315
Khakhuri	141	21
Khairi, Khúrd	124	80
Ditto, Kulân	120	67
Kaoral	18	...
Kallimati	55	54
Kankarwalla	332	124
Kichur	25	3
Kúkwala	96	82
Fathipur	5	5
Siampur	539	137
Shakalwalla	288	46
Sídhurwalla	47	35
Sarangdarwalla	52	39
Sanjtiawalla, Kulân	160	116
Ditto, Khúrd	97	74
Raiwalla	950	204
Rikkikes	2,058	42
Unoccupied land near Kankarwalla	209	...
Ranipokri	176	142
Dalúwalla	82	...
Daodli	101	84
Dalúwalla	51	21
Duiwala	63	33
Jaman Khata	76	47
Jogiwalla Forest	11,496	...
Ditto, Khalsa	14	8
Ditto, Jagir	139	53
Jiwanwalla	1	1
Forest of Siori (near Kansrú)	2,906	...
Sakúwalla	32	30
Partinagar	979	164
Pali	85	12
Phagsi	250	27
Phalsúah	17	14
Purúwalla	79	41
Tappobun	114	67
Forest of Motichúr	18,945	...
Forest of Bangala and Rambala Nadis	19,924	...
Forest of Thanú	14,685	...
Thanú Hatnala	6	4
Tanda	5	...
Forest of Búlawalla	20,706	...
Boodawala	10	5
Bhoputwalla	24	5
Ditto	238	19
Birpur Forest	455	...
Ditto Village	71	...
Bibiwalla	551	44
Bhuttonwalla	76	5
Bhagúwalla	30	...
Burkot	790	274
Biragra	27	20
Bangáin	50	35
Bhogpur	989	230
Balandawalla	39	24
Baniawalla	362	100
Total	1,73,998	4,314

The above list shows the entire acreage of the Eastern Dún (east of Brown's boundary, which is marked in the map with a dotted line.....), including both villages and forests. The latter are written in italics.

G. KING.

Memorandum by MAJOR G. F. PEARSON, Officiating Inspector General of Forests, dated the 2nd March 1871.

As the accompanying report by Dr. King on the Dún Forests, which is full of the most valuable information and suggestions, was sent in to me while I was Conservator, but returned to Dr. King for one or two additions, I would beg to offer one or two remarks on it for the consideration of His Honor the Lieutenant-Governor.

2. The first thing to be done, no doubt, is to fix and clear the boundaries. To fix them, the aid of a Civil Officer will be necessary. I learned from the Commissioner of Mirat that the proper course would be for the Civil Department to give a month's public notice that an enquiry would be made, and the correct boundary of the Government forests laid down on a certain date; that, objections would then be presented and be heard; that, after allowing or rejecting the objections, the boundary should be laid down by the officers as above, and that boundary pillars should be put up, and that, as soon as this is done, the boundaries of the Government forests should be notified in the *Gazette*.

3. The boundaries must then be always maintained clear of all grass and brushwood, and sufficient money for clearing them must be allowed each year.

4 The pillars may be very small if the boundaries are kept clear; they are then less liable to injury. I would make them of masonry, only a foot and-a-half high, with a hole for a wooden post, in the centre, which could be renewed.

5. Next, I would earnestly recommend to the notice of Government the recommendation to lease all the private forests in the Eastern Dún on behalf of Government. Captain Murray is well aware of the value of Dún property, and he might be instructed at once to enter into negociations with grantees and others holding land in the Eastern Dún, only with a view to seeing what would be the total cost of doing so The Western Dún should remain as at present, as it nearly all belongs to private parties. The matter would, however, require much caution. If lessees will not agree to so fair an offer, the question of obtaining legal sanction to interfere with their management of their property in the forests, as recommended by Dr. King, might be entertained.

6. The other points recommended by Dr. King, to which immediate attention is earnestly solicited, are—

1st.—The introduction of a system of leases for collecting dues on minor forest produce in the Western Dún and Siwaliks.

2nd.—Cutting and sale of wood by direct agency, and the prevention of all cutting otherwise.

3rd.—Increase of the grazing dues.

4th.—Close supervision of the Tehri forests in the Dún.

5th.—The sale of commoner woods such as *bankli*, *daura* and *sein*, for the native market, also of bamboos.

7. But, as stated by Dr. King, without ample European supervision, little hope exists of stopping pilfering valuable property belonging to Government from so exposed a situation as the Dún, and I would earnestly recommend to Government that, as by Colonel Baugh's resignation the services of a Deputy Conservator for general work will become available, he should be placed in charge of the Dún, with Captain Murray, and a Sub-Assistant under him. I formerly advocated dividing the Dún into two charges, but I have changed my opinion, and would advise only one charge, with one head office; but a moonshee and two chaprasis might be allowed to the Assistants, which could be provided from the present sanction, so that no extra expense would be entailed. Captain Murray's local knowledge is most valuable in the Dún, but I doubt his having sufficient tact by himself to manage successfully a charge which brings the officer in immediate contact with so many people of every sort of character and description.

8. As soon as a proper staff of officers is obtained, no time should be lost in making a valuation of the Dún forests. Actually counting the trees is out of the question; but, by carefully going over the ground block by block, a fair estimate of the timber in the forests may be formed. The forests then should be divided into as many portions as it will take years to re-produce them; and, as it is never any use to work a forest below its full power, I do not see why the whole of the timber in the portion so allotted for the year's felling should not be taken off the ground, leaving, say, six or seven of the best trees standing, to grow into timber trees. To carry away such a quantity of timber, a tramway would be absolutely requisite to the rivers Ganges and Jumna, but in this way I feel sure that the whole fuel wants of the railways might be supplied, as well as an immense amount of poles and small timber for the canals and for private consumption, and all question as to the necessity of Government going to the expense of plantations would be avoided. Allowing that there are 100 square miles of *sâl* forests in the Dún, and that a rotation of 20 years be fixed, then 5 square miles of 3,200 acres of forest might be cut annually. This at 300 maunds per acre (which is a low average) would give 960,000, or nearly a million maunds of wood annually, half of which might go out as small timber, and half as fuel. This is a very low estimate, and is only made to show how fully the expense of constructing a cheap method of export would be repaid.

9. The block so felled should be closed, and all fire and cattle kept out of it for five years. This would not be difficult. It is true that the grass would begin to grow, but I believe it would be killed again as soon as the forest began to be reproduced.

10. I believe that this is opposed to Dr. King's views, who would deprecate the selling of the more valuable wood for fuel; but, as stated above, I do not myself believe in any advantage in working a forest below its full power, and that timber is only worth whatever it can produce, if brought into use and turned to account. It is essential, however, to provide cheap means of export, and country carts will never admit of any large operations like the above being carried on.

11. In conclusion, the experience of the last eight months will show that it is to better arrangements, and not to criminal indictments, that we must trust to preserve the Dún forests. The time of some of our best officers has been entirely taken up for several months in the courts, and literally no results have been obtained, and it is not too much to say that the prosecutions have been a miserable failure.

Memorandum from Major J. Bonus, R. E., Asst. Secy. to the Govt. of the N. W. Provinces, Public Works Department, Railway Branch, to the Officiating Conservator of Forests, No. 117FD, dated the 31st July 1871.

Informs Conservator that the Lieutenant-Governor quite agrees with Major Pearson as to the value of Dr. King's report, and requests that the Conservator will convey to that gentleman the cordial thanks of Government for the same.

2. It was understood that Major Pearson, in conjunction with the Commissioner, was to go over to the Dún boundaries last cold weather, and lay down a system of procedure. But from his note of the 2nd March, submitting Dr. King's report, it may be gathered that no progress was made.

3. His Honor concurs in the view expressed in Major Pearson's 2nd paragraph, that the boundaries should be laid down at once. The procedure is given in Act 1 of 1847, which arms the Collector, or other Revenue Officer empowered by Government in that behalf, with the necessary authority. Section II requires a notice to be issued, and, within ten days of such notice, the owners or occupiers of conterminous fields are bound to "form" the necessary boundary marks. In default, the Collector will lay them down (Section III); and in the event of dispute he has power to adjudicate, so that the procedure is plain and the powers adequate. The Forest Officer, as representative of the Government as owner, can proceed, after notice has been served by the Collector on the conterminous owner or occupant, to "form" his boundary marks. The General Department will be asked to instruct the local authorities to co-operate, and the work should be vigorously prosecuted by the Superintendent and Deputy Conservator during the ensuing working season.

4. On the other points of the report, His Honor observes that no doubt the Dún is most disadvantageously situated for forest conservancy. This mainly arises from its position, and the occupation of large tracts by grantees some 30 or 35 years ago. The Lieutenant-Governor sees little prospect, in such a locality, of being able to secure the necessary legal powers for controlling and checking the action and exports of private owners. The objection would at once be made—'Why do not the Government officials attend to their own interests and efficiently conserve their own forests?' Endeavours must, therefore, be made to compass the object by departmental arrangements.

5. Dr. King proposes (1) that Government should itself lease all private forests in the *Eastern* Dún, and (2) that it should lease all its own forests in the *Western* Dún, to private parties. Major Pearson concurs in the former proposal, but in respect of the latter would leave the Western forests as they are.

6. Negotiations may be entered upon quietly with the owners of the Eastern forests, to ascertain on what terms they would give Government the lease of their rights. Dr. King says that reasonable terms may be expected, as it is not the owners, but speculators, who have reaped the chief benefits from the forests hitherto. The result of the enquiry should be reported.

7. The ulterior measures proposed by Major Pearson appear to be judicious, and the Officiating Conservator should keep them in view for action as early as possible. But the first object is to make a secure and complete demarcation.

8. The Officiating Conservator's attention is directed to the observations of Major Pearson in regard to the deputation of another Officer to the D n. Lieutenant Bailey with Captain Murray, however, ought to be able to get on very well.

9. Attention is also drawn to Dr. King's observations on the Saharanpur boundary. The Lieutenant-Governor was under the impression that Mr. Williams had carefully arranged the boundary on that side, and planted rows of *Simul*, or *cotton* trees, to distinguish it. The Conservator should arrange for completing what may be wanting.

No. 118FC.

Order.—Ordered, that a copy of the foregoing be forwarded to the Secretary to the Government of India, in the Department of Agriculture, Revenue and Commerce.

From A. O. Hume, Esq., C. B., Secretary to the Government of India, to the Secretary to the Government of the North-Western Provinces, Public Works Department,—(No. 267, dated the 14th September 1871)

I am directed to acknowledge the receipt of the Resolution of the Government of the North-Western Provinces, No. 118 FC, dated 31st July last, and to convey the cordial thanks of the Governor General in Council to Dr. King, for his able report on the Dún Forests.

2. The review of this report by His Honor the Lieutenant-Governor is very complete; and I am only directed to observe that His Excellency in Council hopes to receive a report at the end of the next working season, of how far the actual dèmarcation of the boundaries of the Dún Forests has been completed. When the boundaries have once been demarcated, care should be taken to keep them clear, and it should be distinctly stated in the annual reports whether this has, or has not been attended to. Provision for this work should also be made annually in the Budget estimate.

3. His Excellency in Council will be glad to hear that the proposal for renting the private forests in the Eastern Dún at a moderate figure, has been favorably entertained by the owners of the forests, and successfully carried out.

4. In connection with this case, I am directed to invite your attention to the letters noted in the margin, and to state that the Government of India await receipt of the full report therein called for, relative to the frauds discovered in the Dún Forests, and the orders of His Honor thereon.

No. 792F, dated 22nd December 1870, paragraph 4, from Public Works Department.
No. 26, dated 5th July 1871, from Department of Agriculture, Revenue and Commerce.

APPENDIX J.

REPORT ON THE KADIR OF THE GANGES IN THE N. W. PROVINCES.

From COLONEL A. FRASER, Officiatng Secretary to the Govt. of the N. W. Provinces, Public Works Dept., to the Secretary to the Govt. of India, Dept. of Agriculture, Revenue, and Commerce, No. 280 F-C, dated the 7th December 1871.

With reference to your office letter, No. 268, dated 14th September last, I am directed to submit, for the consideration and orders of His Excellency the Viceroy and Governor General in Council, copy of a memorandum No. 230, dated 31st October last, covering a report by Mr. Ribbentrop on the Kadir of the Ganges below Hardwar.

2. The cost of carrying the timber from the Ganges Kadir to the Canal is considered far too expensive, and would not pay in regard to fuel, and His Honor the Lieutenant-Governor is therefore of opinion that this report is unpromising, both as respects the possibility of an economical planting of the Kadir, or the utilisation of the Dún forests in consequence of the distance the wood would have to be carried; the more so as the Conservator remarks that, without a permanent iron tramway leading to the Jumna and Ganges Canals along the inner edge of the Sewaliks, no large amount of fuel can possibly be delivered.

From the Conservator of Forests, N. W. Provinces, to the Secretary to the Govt. of the N. W. Provinces, Public Works Dept., No. 63, dated the 18th April 1871.

I have the honor to forward a report by Mr. Ribbentrop as to the desirability and suitability of fuel plantations in the Ganges Kadir; also a letter on the subject by the Officiating Inspector General of Forests.

The question is whether the Dún is capable of supplying a sufficient amount of fuel for the railway wants.

I am not aware of what amount may be required, but I feel confident that the Dún forests could, with proper management, yield a continued annual supply of 650,000 maunds.

This conclusion is arived at by supposing the area of forest at 100 square miles. One-twentieth, or 5 square miles, could be cut every year, and the yield, at 200 maunds per acre, would be about 650,000 maunds; 200 maunds per acre is a very low estimate, but each 5 square mile block would have to supply the annual local timber demands before being given over for fuel.

A block should be thoroughly worked out, that is everything should be cut except just sufficient trees to provide shade and moisture for the young copses, and then be carefully preserved from fire, cattle, &c.

I would suggest, for the consideration of His Honor, that next cold season the Forest Surveyor be employed in marking off the Dún into twenty or more blocks, and carefully estimating the probable yield of the forests.

I may remark that without a permanent iron tramway leading to the Jumna and the Ganges Canals along the inner edge of the Siwaliks, I don't think it would be possible to deliver any large amount of fuel.

Memo. from B. RIBBENTROP, Esq., Deputy Conservator, Plantations, Division Panjab, to the Inspector General of Forests.

At a recent meeting at Delhi you expressed a wish that I should proceed to Hardwar to examine the Kadir lands of the Ganges, with a view to ascertaining their value for arboriculture.

I went accordingly to Hardwar, and from there to Boghpur, thence to Rúrki, and again from Hardwar to the same place, Boghpur, by another road, and back to Hardwar *viâ* the left bank of the Ganges, visiting most of the islands either way.

1. The islands higher up the stream have a sandy soil of about 3½ to 5 feet depth, and a sub-strata of granite boulders. The irrigation by means of the river percolating is sufficient, and the drainage through the open sub-soil perfect. The vegetation consists of *Zizyphus* and *Bombax*; cattle browse on the former. The main impediments to the growth of *Sissú* are, 1stly, the jungle fires, and, 2ndly, unrestrained grazing of cattle on the islands. On the left bank of the river, a little below, there are abundant grazing lands much more easy of access than the islands. The lower islands therefore, not being much used for grazing purposes, exhibit a very fair growth of *Sissú* On the more favorable spots, from 300 to 500 maunds of *Sissú* are produced per acre.

I feel confident that, with a little additional cultivation, the whole of these islands might be well stocked, provided, however, that cattle grazing and jungle fires are strictly prohibited,—a prohibition not difficul. to enforce on such isolated spots as these islands.

2. The Ganges Kadirs on the right side of the river can boast of a good loamy sand, and have to a great extent as good a sub-soil as the islands. *Dâlk* (*Butea Frondosa*) is the principal kind of timber grown there. All the higher and not swampy places might easily be planted with *Sissú*, which, I am certain, would flourish there. But let me remark here, that there are many reasons why I do not think it advisable to create a forest on this tract of land. The first, and most important, is the distance of the line of export. All lands within eight or ten miles of the canal are under cultivation, and the fuel would therefore have to be conveyed (that distance at least) on carts or camels over indifferent roads, or even across country. The probable cost of carriage alone before reaching the canal would not be less than Rs. 8 to 10 per 100 maunds. This difficulty, however, would fall to the ground if cultivated land close to the canal were taken up by the Forest Department. Another disadvantage presents itself in the shape of the difficulty of preventing jungle fires without incurring heavy expenses. According to a custom prevalent in the country, all the grass lands are annually set on fire. In so thinly populated a part of the country, we should be obliged to keep up an expensive establishment to prevent the spreading of the fires to our forests.

3. The cost of the first cultivation in high grass would be, per acre, for cleaning and ploughing, sowing, cost of seed, &c., about Rs. 6 or 7. On cultivated land, about 2¾ per acre, I doubt not that the plantation would succeed *as a plantation*, if the land were carefully selected; but I fear it would be but an unprofitable investment of money.

4. Lastly, is a plantation in that part of the country a *necessity*, or are there sufficient means at hand to supply the present and future markets with fuel and timber? On this question of course will depend, more or less, the decision of plantation or no plantation in the Kadirs.

5. The chief place from which the market could be supplied would be the Dún. But, up to the present moment, the lines of export are not handy and unsatisfactory. Moreover, the yielding power of the forest is a thing unknown.

6. I venture to make the following propositions—that, after a careful survey of the *bonâ fide* Government property, all *rights* and *privileges* exercised in the forest, either individually or otherwise, should be carefully enquired into, a valuation survey of the forest should be made in as many places as possible, with a view of ascertaining the age of existing forests, contents of existing forests, and their reproductive powers.

7. According to these facts the forest should be divided into blocks of the same average yielding power. The *rights* and *privileges* should then be strictly regulated, and, where they interfere with reproduction, should be bought up, or otherwise disposed of.

8. Once the preliminary points settled, we are in a position to say that we have a Government forest in the Dún, which, by means of a well regulated management, will yield annually a *certain* amount of timber and fuel. I believe the amount would be so considerable that there would be no occasion for new plantations, and it would pay even for a permanent tramway to the nearest market. The Dún is of such vast extent that a tramway and road made at a considerable outlay would prove eventually remunerative.

9. However, to solve these questions in an able and competent manner, a thorough knowledge of all the necessary figures and statistics is indispensible,—a knowledge which I have been unable to gather.

10. But even should there be only 50,000 acres of Government forest, a regular return of upwards of 500,000 maunds of fuel may be expected by an average circulation of twenty years.

11. It has been stated that the wood of the Dún is too valuable for fuel. This is perfectly correct as long as all the wood the forest produces can be sold as timber; but if this is not possible, it is surely more profitable to sell the rest for fuel. Not to work a forest up to its full producing power, provided there be a market of any sort for it, is simply waste of money.

12. I think it would be worth while to ascertain the amount the existing forests can yield, what would be the cost of the transport of produce, and what chances we have of natural and artificial reproduction. All these points should be ascertained before taking up new lands for plantations.

From MAJOR G. F. PEARSON, Officiating Inspector General of Forests, to the Conservator of Forests, N. W. Provinces, No. 42, dated the 17th March 1871.

I have the honor to forward, for the information of His Honor the Lieutenant-Governor, North-Western Provinces, a report on the Kadir of the Ganges, and its suitability for plantation operations, by Mr. Ribbentrop, the Deputy Conservator of the Plantations Division in the Panjab, whom I requested to visit Hardwar for the purpose of giving his opinion on the question, and who from his valuable knowledge and experience is specially qualified to form a correct judgement about it. The question of planting the Kadir has several times been before Government, and it has constantly been a subject of consideration to myself.

2. I may state that I entirely concur with Mr. Ribbentrop, whose report bears out what I have said officially before, that, in my opinion, the forests in the Dún are more conveniently situated, as well as ample in their resources for all demands that can be made on them for fuel, if they are only properly worked with that view, and I believe that, if a really capable officer were appointed to the Dún to carry out the work, ample resources would be found in the forests to repay the outlay on constructing a tramway.

3. I would suggest, for the consideration of His Honor the Lieutenant-Governor, that an opportunity of a vacancy occurring might be taken to appoint a Native (a Hindú would be best) of high character as Sub-Assistant Conservator in the Dún. The assistance of such a person would be of

great value to the Deputy Conservator. The Tehsildar of Kasi would perhaps be a suitable man. The controlling staff would then consist, without any addition to the present forest establishment of the North-Western Provinces of—

1 Deputy Conservator (instead of in the Kamaon fir forests);
1 Assistant Conservator (as at present).
1 Native Sub-Assistant (as at present, but a Native).

At present, however, if Mr. Atkinson has been appointed, there is no vacancy for a Sub-Assistant Conservator.

4. Mr. Ribbentrop's report may be conveniently printed as an appendix to Dr. King's report on the Dún.

APPENDIX K.

REPORT ON THE FORESTS OF THE HASSAN DISTRICT IN MYSOR.

From CAPTAIN G. J. VAN SOMEREN, Conservator of Forests, Mysor and Khurg, to the Secretary to the Chief Commissioner of Mysor and Khurg, Public Works Department,—(No. 1401, dated the 18th February 1871).

* * * * * * * *

6. The forests in Hassan are of both classes, "Evergreen" and "Deciduous," or those in the Malnad and in the Maidan country. The former have as yet yielded scarcely any revenue from timber, chiefly from their being higher up the Ghâts than forests of the same description in South Kanara worked by the Madras Forest Department; and partly because the far more important and lucrative operations in the Mysor district have hitherto precluded the Assistant Conservator of Ashtagram from giving any but the most cursory attention to this portion of his range. When I was Assistant Conservator in Ashtagram, I ascertained that wood *could* be floated from the Sundakumri jungles, and from a portion of the jungles on the Kabanala Ghât to Mangalur, but that the expense would be high. I think, however, that if an officer was specially appointed to this district, he could, by surveying all the routes by land and water out of these forests, and furnishing all information necessary to possible purchasers, be enabled, by low prices being at first fixed on the timber, to tempt buyers from the western coast. Wood also might be sawn up in Sundakumri and brought to the Kempholle Ghât (Manjerabad) and find a market at Mangalur.

7. But if these forests cannot at present be looked to for revenue from timber sales, they will give us something from being rented out for *Cardamom* planting. Mr. King has completed his survey and inspection with this special object in view. I met him personally four days ago, and from what he told me, it will be probable that all the Ghât State forests, and most of the district forests on the Ghâts, will be rented out in plots of from 500 to 1,000 acres.

8. The *gamboge* tree (I believe the true *gamboge* of commerce), is abundant in portions of these forests, and this might, if regularly worked, produce a revenue. Putting these three sources of revenue together I have estimated the probable income from the Ghât forests at Rs. 5,000.

9. *Deciduous Forests.*—The more important of these I have already detailed in my report on the Hassan District (docket No. 865 of the 19th October last). Those which are likely to at once produce revenue by the sale of timber are the Húlkúnda, Nagawara, and adjacent jungles in the south of the Maharajdrúg taluk, from which wood could be cut for the supply of Arkalgod, Narsipar, Hassan, and portions of the Periapatam taluk of Mysor district. The jungles in Bailúr require opening by roads; they would then, I think, be able to provide wood at rates sufficient to cover cost of carriage, supervision, &c., to Bailúr and Harabulli.

10. The Vijraiapur cowl in Arkalgod taluk; the Biba and Thatai cowls in Hassan; the Margalú jungles in Arkalgod would all produce small wood and fuel. The Sigaigúda cowl in Hassan and some *babul* tracts in Chenroyapatam taluk would also yield a small return. The Mutti jungles near Belgod, and round Kenchama, Hoskotta, and Canigeri and Moggi, all in Maharajdúrg taluk, would also yield much fuel. From these sources I estimate the returns at Rs. 7,000.

11. *Sandal-wood.*—A careful inspection of the greater portion of the *sandal*-producing taluks of this district has shown me that Monigars require closer supervision to force them to work in the more remote parts of the *sandal*-bearing jungles. It also showed me that in many parts existing *sandal* trees require to be cleared from the creepers which are choking them, and also to be protected from damage done them by herd-boys and villagers of all classes. The late orders issued by the Chief Commissioner on the subject will doubtless bear much fruit, but the presence of an officer specially charged to look after this work will do much more. The out-turn of *sandal*-wood in this district can be very safely placed at 500 candies (125 tons) per annum, valued at Rs. 42,500. Care in nurturing and protecting wild *sandal* will, in ten years time, add considerably to this estimate, without taking into consideration the produce of *sandal* in reserves growing up for future years.

12. *Hardwood plantations.*—As I have already reported, I think it not improbable that *teak* plantations would succeed at Gopiguddithuggú in Maharajdrúg, I believe the Moolkoonda Nagawara forests would also in parts grow *teak*. It is not to be doubted but that *honay* (*pterocarpus marsupium*), and *arsentagga* (*nauclea cordifolia*), *biluara* and *baj* (*accacia odorotisimia* and *speciosa*), will all succeed if planted in these localities. Bamboos will thrive luxuriantly.

13. *Fuel plantations.*—These should be made at the Vijiapúr, Biba, and Kuttai, cowls, and the fuel produced will always find a ready sale. Closing these cowls at once to the public, and selling what is now on the ground I estimate will give an immediate return of Rs. 3,000.

14. *Sandal plantations.*—We then come to this most important subject, *sandal*, if cultivated, will grow in the Vijiapúr, Biba, Kattai, and Siggigúda cowls; will grow luxuriantly on the borders of the Húlkúnda Nagawara forests, in Canigeri, and generally throughout the Bartúr valley near the Hemavutti river in Maharajdrúg taluk; will grow to a great size in several parts of the Bailúr taluk and of Hassan and especially well in the Uchingahobli of Manjarabad. With a Forest Officer in charge of the district, who would pay due attention to this work, and with sufficient funds, I think not less than 1,500 to 2,000 acres of land might be covered in a few years with this most valuable wood.

15. As I stated at the beginning of this letter, the Hassan district cannot be looked to as being immediately and highly remunerative. It will, however, pay its way, and there can be no question that its forests are greatly in need of conservancy proper, and that the establishment of *hardwood* and *sandal* plantations will be of great and lasting benefit to the Mysor revenues.

16. The remarks which the Chief Commissioner has been pleased to make on my report for 1869-70 (see Chief Commissioner's review paragraphs 9, last clause, 14, 20 and 24), encourage me in hoping that the proposals now under review will meet with favorable consideration.

17. In paragraph 2, clause 3, of your letter No. 25F of the 19th January last, the Chief Commissioner directs that "the planting of *sandal* and *teak* reserves, and of belts of fuel round available tanks, should undoubtedly be pushed on." I respectfully submit that more officers are required with more establishments for such work.

APPENDIX L.

REPORT ON KUMRI CULTIVATION IN MYSOR.

From MAJOR W. R. JOHNSON, Officiating Secretary to the Chief Commissioner of Mysor, Public Works Department, to the Secretary to the Government of India, Public Works Department,—(No. 183, dated the 22nd June 1871).

Referring to your letter No. 237F, dated 17th May 1870, on the subject of Kumri cultivation in Mysor, I have the honor, by direction of the Chief Commissioner, to forward herewith, for the information of His Excellency the Viceroy and Governor General in Council, copies of reports, as per margin, from the Conservator of Forests, who, it will be seen therefrom, has duly carried out the instructions conveyed in paragraphs 5 and 6 of the letter under reply, and has supplied as full an account on the several points adverted to in those instructions as could probably be furnished, considering the character of the subject and the difficult nature of the country that had to be traversed in collecting the materials therefor.

No. 1507, dated 14th March 1871
" 369, " 6th June 1871.

2. The map appended to the first of these reports shows the limits of the tract in which it is proposed that the cultivation in question shall be permitted, and the Conservator draws attention to the circumstance that, with some specified exceptions, Kumri in Mysor is not carried on on the ghâts or higher line of hills, but below and to the eastward of them.

3. In paragraph 5 of this report the Conservator describes the limits, as marked on the map, within which he is of opinion that Kumri may be permitted, an essential condition being that it shall nowhere extend beyond a line running six miles to the eastward of, and parallel to, the Mysor frontier. He deprecates its being allowed south of the Hossangaddis Ghât, which he has fixed as the limit in that direction.

4. In paragraphs 8 to 13 of his report, the Conservator describes the tracts in which Kumri has been carried on, and the general character of the timber growing in them, which he considers of little intrinsic value, and such as would never command a ready sale. The kan and forests noted in the margin, he proposes, shall be preserved from Kumri depredations, and attempts made to work them.

Sumpunjee Hollay Kan.
Hinny Forests.

5. The rivers and streams draining the tracts in question are described in paragraphs 6, 7, and 14 of the report, and it will be observed that most of them, rising in the higher line of ghâts, run to the eastward.

6. The decayed and more or less ruined condition of the gardens and other cultivation (not Kumri) in this neighbourhood, is commented on in paragraphs 15 to 17 of the report, and the complaints of the people on the subject of the prohibition of Kumri are fully entered into in paragraphs 18 to 20. It will be seen that they urge that the forbidden cultivation may be allowed only on the lands formerly used for it, and aver that no new lands would be required for the purpose, and that the Conservator remarks with surprise on the effective manner in which the Government orders putting down Kumri had been enforced.

7. In paragraphs 21 and 22 of his report, the Conservator considers the probable results of the re-introduction of Kumri in the tracts under advertance as regards (1) the change it would cause in the condition of the forests, and (2) its effects on the drainage of the country, and he is of opinion that these results will not be injurious in either respect, though he expresses his views with diffidence on the second point.

8. Finally, the Conservator concludes (paragraphs 23 and 25) that, so far as forest questions are concerned, Kumri cultivation may be re-introduced on certain conditions specified by him.

9. In paragraph 25 the Conservator estimates the number of able-bodied men who would engage in Kumri cultivation, if it be sanctioned, at probably about 500, who with their wives and children, would add from 2,000 to 2,500 to the population; but this is confessedly not to be depended on. The enclosure to his subsequent letter, No. 369, shows that the Deputy Superintendent estimates the number of men at 190, and of villages or hamlets willing to engage in this cultivation at 22, one of the latter of which, the Conservator states, is situated beyond the line six miles from the frontier he proposes to make the eastern limit. Lieutenant Vansomeren, however, still considers his estimate that which will probably prove to be nearest the truth, as it was arrived at from the statements of men on the spot.

10. On a full consideration of all the circumstances of this class of cultivation, as thus and previously reported, the Chief Commissioner recommends that it be permitted to be re-introduced within the limits proposed by the Conservator, and on the conditions specified by him, the cultivation being strictly restricted to the lands formerly used for the purpose, and any fresh clearances being interdicted. It may not be possible to enforce the second and third conditions; but as they appear to be important to the preservation of the land from wasteful injury which they will probably prevent to any serious or general extent, the Chief Commissioner would retain them. The eastern limit of the cultivation will have to be marked off as proposed by the Conservator; also the kan and forests it is desired to preserve as State forests; and a list of the other virgin kâns and forests as yet untouched by Kumri will be prepared by the Revenue Department.

11. With respect to the rates of assessment that should be imposed on this cultivation, the Superintendent of the Revenue Survey has not yet reported on the subject, none of the survey parties being employed in that quarter. The rates of assessment formerly levied might be imposed, if the above proposals be approved, until the survey operations reach the Kumri tracts, when they would be revised and fixed with due consideration to the rates levied on other kinds of cultivation in the neighbourhood.

12. In conclusion, I am to express the Chief Commissioner's regret for the unavoidable delay that has occurred in procuring the information required to complete this report, and to state that Lieutenant Vansomeren (who has taken much pains and gone through much exposure and fatigue in his efforts to effect this object) could not have carried out his enquiries in that unhealthy locality at an earlier period.

From LIEUTENANT G. J. VANSOMEREN, Conservator of Forests, Mysor and Khurg, to the Secy. to the Chief Commr. of Mysor, Public Works Department,—(No. 1507, dated the 14th March 1871).

I have the honor to submit the report called for by the Government of India on the probable result of the re-introduction of Kumri in certain portions of the Nagar Division of Mysor. The correspondence alluded to is marginally noted.

Govt. of India's Order No. 237F, dated Simla, 17th May 1870.

Para. 5.—"The Conservator of Forests should be instructed to examine the forests in question; to report upon the trees they contain, and the probable changes in the condition of the forests which would follow the re-introduction of Kumri clearings. He should state by which streams and rivers the tract of country in question is drained; whether the clearing of the forests is likely to have any injurious effect connected with the drainage of the country; the retention of the soil on the sides of mountains and in valleys, and the washing down of silt and sand."

Letter, General, Revenue Forest, No. 1321-53 of the 3rd June 1870, from Secretary to Chief Commissioner, to Conservator of Forests, conveying instructions on the above orders.

2. The map alluded to in paragraph 6 of the Government of India orders is, by paragraph 2 of your letter (marginally noted), directed to be supplied with my report, which I now do.

Reasons for inspection being delayed.

3. The orders to report on the subject of Kumri cultivation reached me in the rains; and as the whole of that part of the country is exceedingly unhealthy for some time after the south-west monsoon (the Chief Commissioner having approved of my inspection being deferred till February 1871), I began my inspection on the 24th February, and completed it on the 11th March. Owing to the weather being dry, I was enabled to go very lightly equipped, and walked the whole tour; thus going to many spots where it would have been difficult to take horses. The red line on my map shows the actual route I followed; the green coloring, the forests and evergreen kans; and the brown coloring, the spots in which Kumri cultivation was formerly practised.

Explanation of map.

Kumri generally below the ghâts.

4. It will be noticed that, with the exception of the country south-west of Savantanicattay and near Govardanagheri Drúg, kumri in Mysor is not on the actual ghâts, but below and to the east of them. During my tour I went to the boundary on the Hossangadi Ghat and down into the South Kanara country at three different points, *viz.*, two miles down the Madú Ghât (an old bullook path), five miles down the Kúlúr Ghât (a made road), and about three miles down the Hagiwaddi bullock pass. This gave me an opportunity of seeing the South Kanara Kumri, which is of far greater extent than that in Mysor, and has been carried further up the sides of the ghâts; but nowhere did I see any Kumri on the tops of the ghâts. The Mysor boundary in many places is east of the actual ghâts.

Tract of country to which Kumri may be allowed.

5. The map now submitted shows the tract of country traversed this tour, and in a portion of which Kumri may (if sanctioned) be permitted. This portion is situated in the talúks of Nagar and Sagar, and lies north of the Hossangadi or Hyderghar-ghât, and south of the Gairsoppah Ghât; is bounded on the west by the limits of the Mysor Province, and east by a line which should run parallel with the Mysor boundary at a distance from it of six miles, as proposed by Major Hay, Superintendent of Nagar (see paragraph 10 of letter, General, Revenue, Forest, No. 1600-9 of 21st June 1869, from Chief Commissioner of Mysor, to Secretary to Government of India, Public Works Department).

6. The drainage of this tract of country runs either directly west, through the ghâts, or falls into the Sherawutty river, which, rising in Kaulidrúg, runs north through the Nagar and Sagar talooks to the Gairsoppa falls, when, turning west, it falls into the sea at Honore.

Drainage.

7. The drainage of the Yeddúr country, south of the town of Nagar, goes south, and eventually west; while the whole of the drainage of the country in the Kaulidrúg and Koppa talooks is eastwards, feeding the two great rivers, the Badra and Túnga, or their affluents. On the ghâts bounding these two last-named talúks, the practice of Kumri cultivation was never very prevalent; and as the Badra and the Túnga are both practicable for floating operations, and it is under contemplation to fell timber and fuel along and in the neighbourhood of these rivers, I would deprecate any Kumri being allowed south of the line I have mentioned in paragraph 5, *viz.*, the Hossangadi Ghât.

8. Between the Hossangadi and Madúr roads is a vast mass of forests on the ghâts and in the Mysor country. East of this are small patches of Kumri, and to the west, in the South Kanara side, the low lands are Kumried throughout. I could get no one to accompany me, or show me the way through this forest. It is excessively precipitous; and, though the subordinate revenue authorities did their best to get me guides, no one would go in: one and all declared that it was pathless; that no one ever went there for any reason whatever. No one could take me further than to the top of Múlgúta, on the outer edge, and from which a spur runs down to Hossangadi. I had an opportunity of seeing the tree vegetation of a part of this forest from the Hyderghar-ghât on the south, and from the Madúr Ghât on the north. In the portions visited, I saw *ebony* in abundance, *bullagi* (an iron wood), some *wild jack*, but no *pún*; and I may here state that with the exception of a few trees in the Kadu-Mullij-kan between Kúlúr-mannay and Húlúr-mannay (Nos. 11 and 12 in map), and a few near the Hinni Ghât in the vicinity of the Falls (No. 20), I saw no *pún* in the whole of my tour.

Poon excessively scarce.

9. Between the Madúr Ghât and the Hagiwaddi Pass there has been much Kumri in patches. Large extents of kan land have been left untouched, and Kumri has been confined chiefly to the sholas on the hills, with the exception of the jungle on the Yeddamallay and Cajji Banays (No. A. B), where a large block of forest has been laid low under the axe.

Madúr Ghât to Hagiwaddi Pass.

10. In the pocket between the Hagiwaddi Pass, immediately to the north of the Hagiwaddi kan itself (one of the finest bits of forest scenery in the country), and Savantanicuttay, the whole of the jungles have been Kumried. The same may be said of the narrow slip of Mysor territory which, projecting itself into the Kanara country, terminates in the Govardanagheri Drúg. North of this are the Hinni forests and large kans, and but little Kumri.

Kumri near Savantanicuttay very extensive.

11. The vast majority of trees seen by me in these forests and kans, though used by the inhabitants of the country, are of but litle intrinsic value. Even were the forests accessible, the timber would never, I think, command a ready sale. The better kinds, such as *ebony* and *bullagi*, are extremely heavy woods, and the cost of carriage would be so great as to preclude all hope of a fair return of revenue.

Forests and kans not valuable.

12. In those portions which were Kumried many years ago, and which have since grown up, and in the kans to the east, I noticed the following useful trees:—Nundi (*lagerstrœmia mic.*), *black wood*, (*dalbergia,*) but scarce, *honay* (*pterocarpus marsupium*) *honalú*, (*a terminalia*); and in the low forest near the Serohulli river two or three kinds of *dyospyros* and some *oodina woodier*, and here and there patches of stunted mutti (*terminalia tomentosa*).

Tree vegetation in old clearings and kans to the east

13. As I have already stated in paragraph 10, the whole country between Hagiwaddi and Savantanicuttay may be considered as having been under Kumri. Throughout these was a dense undergrowth of thorny shrubs, among which, in several spots, thousands of of wild plantations had sprung up. Immediately to the east of this will be seen on the map a large patch of green. This represents the Sampanji Hollay kan, a large tract of forest in which *poon* and other valuable trees are fairly abundant. This kan, and the Hinni forests further north, will both be preserved from the depredations of the Kumri cultivators, and attempts made to work them by floating wood down the Serohulli and Gairsoppa rivers.

Appearance of old kumri near Savantanicuttay.

Sumpanji Hollay kan.

Hinni forests.

14. The chief rivers draining the tract of country under report are the Gurgat, the Serohulli or Vencatapúra, and the Sherawutti, the course of which I have already described. The Gurgat and Serohulli both run due west, through the ghâts. The great majority of the streams run eastwards. The Madúr river, when I crossed it, was dry, and so were the streams on the

Rivers.

Kúlúr Ghât. I may here mention that, with the exception of the large rivers, the majority of the streams in the trigonometrical map could not be recognised. They seem to have been laid in very roughly.

Cultivation.

15. Between the town of Nagar and the village of Kalasosi there are several patches of paddy cultivation, and some Areca nut gardens. Between Kalasosi and Margatúra and Nagawaddi, Nos. 3, 9, and 13 in map, paddy was very rare, the chief cultivation being that of the *Areca nut-tree*. Between Nagawaddi and Carni, No. 15, paddy flats and Areca nut gardens were again intermixed, and north of Carni the Areca nut gradually disappeared, and I saw none at all north of Hagiwaddi, but large paddy flats were frequent. The cultivators of paddy throughout depend entirely on the monsoon rains for the necessary supply of water.

Very few kans occupied and paying shist.

16. Throughout the whole tour, I passed through but one occupied kan near Kalasosi. The rent paid for it to Government is Rs. 4. It contained some *wild pepper vines*, and several *being moras* or *sago palms*. In several unoccupied kans I noticed *sago palms*, and here and there *wild pepper vine*; but these were few and far between. Some few of the kans in the north, which I did not actually pass through but only saw, were said to be occupied, and paid a trifling rent to Government.

Cultivation of gardens and kans very careless.

17. All the Areca nut gardens which I saw were carelessly tended, full of weeds, and with broken water-courses; and I nowhere saw any bitel vines trained up the trees, as is so commonly the case in other parts of the country. Thari-kúli and Genasina-kúli, Nos. 5 and 6, were entirely desolate, and the gardens at Kadú-Kodú, No. 4, were all but abandoned. At Holipoora, one of the larger villages in that locality, the gardens, though better than at the spots just mentioned, were much in want of careful looking after. At Kúlúr-mannay the gardens were surrounded with old Kumri, covered with dense small growth, and the owners complained bitterly of the order prohibiting Kumri.

Complaints of the order abolishing Kumri.

18. Throughout my tour I was accompanied by several of the most influential men of the villages through which I passed. They were all either Haiga Brahmins or Jains. They one and all begged that the old state of things, when Kumri was allowed, might be re-introduced, and I received several petitions from the inhabitants of the different naads all to the same purpose, and several Maharattas (actual Kumri cultivators) preferred requests of a like nature. I had several conversations on the tour with these men; as a rule, I found them moderate in their demands, and careful in their statements. In one or two instances, where some men made absurd statements, they were at once silenced by the others. One and all held that the stoppage of Kumri cultivation had largely reduced the population of the country; that paddy fields and Areca nut gardens had all suffered from want of sufficient labor; and that, while they themselves had been put to great inconvenience and loss, the Government had suffered directly by loss of revenue, and indirectly by the loss of inhabitants in the country. The Maharattas whom I met were all anxious to get back to their old work; and if it is true (as doubtless was the case) that these Maharattas were practically slaves or bondsmen, they do not appear to have been at all unhappy under the old *regimé*.

Loss of labor the great grievance.

19. The chief grievance is undoubtedly the loss of labor. While speaking with a number of men at Hallapúra on this subject, several coast coolies passed. These men had been hired by a Chetti to carry loads up the ghâts, and were returning. I engaged them to take my things on the next stage, and of course asked why súpari cultivators could not get up men from the coast, where they are abundant, and work up their gardens. They said "Oh! we should have to pay each man 4 annas a day, and they would go away whenever they chose. How could we make any money out of our súpari?" This confession showed me the exact truth of the case. If Kumri were allowed, the men who cultivate in that fashion are obliged either to wait or return from their crops. The súpari cultivators who are, without exception, almost all Haiga Brahmins or Jains, make small advances to the Kúmbaries or Maharattas, and then, by supplying them with rice, clothes, &c., get them into their power, and always ready for work. This, though perhaps a species of slavery, is no worse, I conceive, than what goes on all over the country more or less, the Saukar in the plains taking the place of the Haiga Brahmins in West Nagar; and of the two, the little finger of the Saukar is, I should say, thicker than the loins of the Haiga Brahmin.

Requests made.

20. The whole of the petitioners asked only that the old Kumri lands might be given back to them; that they would amply suffice; and that no new land would be touched. I was surprised to find how well the Government orders putting down Kumri had been obeyed in these out-of-the-way parts

From what I saw I should think there has been very little unauthorised kumri. The latest fellings were at Haggari, near Watiki, and were about five or six years old.

Effects likely to follow the re-introduction of kumri.

21. I have been directed to state my opinion as to (1) "the probable change of condition in the forest which would follow the re-introduction of Kumri;" and (2) "whether the clearing of the forests is likely to have an injurious effect connected with the drainage of the country, the retention of soil on the sides of mountains and valleys, and the washing down of silt and sand." With regard to the first point, I think that the effect of the re-introdution of Kumri will be to increase the number of deciduous trees in the adjacent kans and forests. *Mundi, blackwood, honay, mutti, sampaghi, honolú* and other *terminalia*, amongst them *terminalia bellerica* and the *Nelli emblica officinalis*, and a few scattered specimens of *biloara* and *bagay* (*acacia odoratissima* and *speciosa*), were noticed in old grown up Kumri clearings, and on the skirts of the adjacent kans. The first named six kinds of trees and the two *acacias* are all useful woods; at the same time, with the exception of the *honolú* and some few of the *mutti* and *acacias*, most of the trees just mentioned were ill grown. With reference to the second point, effect on drainage, &c., I give any opinion at all with very great diffidence. As I have already reported, and as the map will show, Kumri clearings in many parts are so interspersed with untouched forests, especially in the country from near Madúr to Hagiwaddi, that I do not think any ill effects need be feared from the wash of soil off mountain sides. Having come into the Mysor country after the promulgation of orders abolishing Kumri, I can have had no opportunities of drawing any conclusions from observations of the former state of things as compared with that now existing. Again, the effects of silt and sand being washed down the ghât streams, would be felt more in the South Kanara country below the ghâts. I had an opportunity during my tour of meeting Mr. Webster, the present Acting Collector of South Kanara, who, owing to his having formerly served in the same province as Assistant Collector, is well acquainted with it. He told me that he had paid much attention to Kumri in all its bearings; he could not say that there was any perceptible change in the rivers and streams which come down from the ghâts, and that the rainfall and its effects seemed to him much the same as in former years.

22. I could only form an independent conclusion from the following observations: The town of Nagar is surrounded with several fine old stone bridges. It lies in a basin surrounded by hills, on several of which Kumri was formerly practised to a small degree. I could not see anywhere that the piers of these bridges had accumulated sand round them, though such accumulations would be largely aided by the broken trees and bamboos which, washed down the streams year by year, had piled themselves up in heaps against some of these bridges, notably that of Hilkúnji.

Conclusion that Kumri may be re-introduced

23. The conclusion at which I arrived after my tour, and much consideration, was that, owing to the inaccessible nature of the forests and country generally, and to the small quantity of timber possessing any market value to be found in these forests, Kumri might, as far as any forest questions are concerned, be again allowed on the following conditions:—

Conditions.

(1.)—That none but old Kumri lands be allowed to be opened out again.

(2.)—That no other grain than *ragi* be allowed to be cultivated on these clearings, and no more than two successive crops be taken off each piece.

(3.)—That after two crops have been taken, the land be allowed to be quiet for ten years.

24. It was formerly the practice to take two crops of ragi, and follow them in the third year by a crop of same (*panicum miliare*); this latter crop thoroughly exhausts the soil, and the jungle will not again grow up for 20 to 25 years; thus tempting the Kumri cultivators to seek virgin land.

25. I have been directed to state, in conjunction with the district officer, the number of villages and of inhabitants who would be allowed to cut Kumri if finally approved. This is a most difficult question to answer. I believe the number will fluctuate yearly; but as nearly as I can estimate from the very widely differing numbers given me by the chief men, about 500 able-bodied Maharatta men will be employed. These, with their wives and children, will bring about 2,000 to 2,500 people into the country. At present the greater portion of the labor which would be attracted by the re-introduction of Kumri is not in the country; and in West Nagar, several places, which figure in the trigonometrical map as villages, consist of one house owned by a Haiga Brahmin or Jain, and three or four miserable hovels, in which the few laborers he now employs find a precarious shelter.

26. I now submit this report as it stands, and will, with the permission of the Chief Commissioner, submit, with all practicable despatch (after consulting the Deputy Superintendent), the return alluded to in the preceding paragraph.

27. If Kumri is to be again allowed in old clearings, it will be necessary to mark off, by *stones*, the extreme eastern limit to which it may be extended. The subordinate revenue authorities should make a list of all virgin forests and kans, and the Forest Department should mark off by stones the Sompanji Hollay and Hinni Forests.

From the Conservator of Forests, Mysor and Khurg, to the Secretary to the Chief Commissioner of Mysor, Public Works Department,—(No. 369, dated the 6th June 1871).

I have the honor at length to report on the question asked by the Government of India as to the number of men likely to cultivate on the Kumri system in Nagar, if that system were again introduced.

2. I had the honor of submitting my report on the matter in my letter, No. 1507 of the 14th March last; but not having obtained the opinion of the Deputy Superintendent, Shimoga District, till yesterday, I was unable to answer the question earlier.

3. The Deputy Superintendent has sent me in a list of the villages and the number of men willing to cultivate. He gives no opinion as to the number of men who are likely to be employed.

4. I submit a copy of his list, and beg to state that I visited the villages marked with a cross (+). Many of them are mere hamlets, and some, *viz.*, Kúlúr-munnay, Umblinadikay, Hallapúr, and Genasinakúni, consist of one and two houses each. The four men at Kúlúr-munnay are Brahmins, who will employ, as they told me, 25 men. The owner of the one house at Hallapúr (a Jain Brahmin) will employ 10 men and their families.

5. According to the Deputy Superintendent's list, 190 men are "willing to cultivate," they inhabit 22 so-called "villages." As I have already reported (see paragraph 25 of my letter referred to above), much of the labor will have to be imported, and it is impossible to fix on any exact number. I still incline to hold to my opinion already expressed, and which was formed on estimates given me by men on the spot, that about 500 able-bodied Maharattas will be brought into the country, and that with their wives and children they will increase the population by about 2,000 to 2,500 souls.

6. The village of "Bobagi" is named in the list of the Sagar Talúk. Bobagi is some way from the ghâts; and far beyond the line I would propose to draw as the eastern limit, *viz.*, six miles from the Mysor western boundary. It should be, I think, clearly understood that, though villagers living beyond this line might be allowed to cultivate on Kumri, their Kumri holdings would invariably be within the line.

List of Villages affected by the proposed permission for the Kumri cultivation on the Ghâts in the Nagar and Sagar taluks.

NAGAR TALÚK.

Cubnad Magani.

			No. of men willing to cultivate
1		Kúlúr-munnay	4
	+	Kattinaholay	2
	+	Hollapúr	4
	+	Kodakodu	2
5	+	Umblinadikay	2
	+	Genasinakúni	2
7	+	Hiray-manay Bellakka and its hamlets	3
		Residents of Nagar Magani willing to cultivate	11

SAGAR TALÚK.

Sowlnad Magani.

1		Bobagi	15
	+	Hebballi	5
		Tili	4
		Kaltinakara	15
5		Alúrú	10
	+	Chennagonda	15
		Valuru	12
	+	Ikki-bilalu	10
		Saukana Shanbogni	8
10		Mirantú	15
	+	Kodanahulli	10
		Karana	15
		Malúr	16
	+	Ib-bulalu	8
15		Karla	10

H. M. ELLIOT,
Deputy Superintendent.

The 31st May 1871.

From A. O. HUME, Esq., C. B., Secretary to the Government of India, in the Department of Agriculture, Revenue and Commerce, to the Chief Commissioner of Mysor,—(No. 121, dated Simla, the 9th August 1871).

I am directed to acknowledge the receipt of your letter, No. 183F, dated 22nd June last, recommending that the re-introduction of Kumri cultivation into certain portions of the Nagar Division of Mysor may be permitted on certain conditions; and in reply to state that, while the Governor General in Council does not entirely agree with your proposal, His Excellency is willing to admit of their modification so far, that when the operations of the revenue survey are extended into the district in question, a certain portion of land in each village, not exceeding the total area under other cultivation, may be marked off, for disposal to village laborers, for the purpose of Kumri cultivation, and allotted in proportion to the other cultivated land of each holder, in the same manner as a certain amount of land is allotted to each Wargdar in Madras for this purpose. In both North and South Kanara Kumri cultivation is strictly limited, and is gradually diminishing. If, therefore, the above arrangement is adopted in Mysor, and the survey officers mark off the tracts for Kumri in each village in concert with the forest officers, His Excellency in Council believes that no injurious effects need be apprehended by the re-introduction of Kumri into the province within the tract in question.

Office Supdt. Govt. Printing.—No. 9120, A. B. & C.—29-5-72.—850.

APPEDNIX M.

PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

LOWER PROVINCES OF BENGAL,

FOR THE

Year ending 1st April, 1871.

BY H. LEEDS, ESQ.,

CONSERVATOR OF FORESTS, BENGAL.

No. 234, dated 31st July 1871.

From—H. LEEDS, ESQ., *Conservator of Forests, Bengal,*

To—The Secretary to the Government of Bengal, Revenue Department, Fort William.

I HAVE the honor to forward the Annual Forest Administration Report for the year ending 1st April 1871.

SECTION I.

INSPECTION OF FORESTS.

UPPER ASSAM.

THE general inspection of the forests in Assam was completed in April and May 1871. The work done during those months was included in last year's Report as part of the season's work.

2. It was intended that during the past season valuation surveys, with a view to selections of tracts as Reserved Forests, should be made on the Dehing and Dhunsiri rivers, Upper Assam; and work was commenced in the Jeypore mouzah, where several surveys were made and entered on the district map; but the health of the Assistant Conservator having broken down early in the season, the work was stopped, there being no other forest officer at hand to carry it on.

LOWER ASSAM.

3. In Lower Assam instructions were issued for survey of the Kamroop Dooars, which are rich in Sâl, as also of the Sâl tracts in the Durrung district; but from several causes, arising partly from sickness of the officer in charge of the sub-division, the loss of time incurred by him in joining, and want of general aptitude for the work, nothing was done.

4. As belonging to Lower Assam sub-division, this is perhaps the best place to refer to the Jeerung forests in the Khasi Hills, reference to which was made in paragraph 13 of Government of Bengal resolution dated 12th December 1870. It appears from a report submitted to the Commissioner of Assam by the Deputy Commissioner, Khasi Hills, that British interests in these forests commenced from the year 1859, when an agreement was entered into between the Government and the Chief in charge of the Jeerung ilaqua, under which Government obtained a perpetual lease of these forests.

5. The translation of the document runs as follows:—

"I, Chootoo Sadoo Sing, Rajah, Zemindar of Jeerung ilaqua, execute this agreement, that at the wish of the Government I willingly lease all the forest and waste lands pertaining to the Jeerung ilaqua (by the clearing of which no damage will arise to the ryots of the ilaqua), and also all minerals that may be discovered hereafter, to the British Government in perpetuity. I agree that from henceforth the said Government may, at their pleasure, receive revenue from those lands, causing them to be brought under cultivation, or settling them under ryots, and that neither I nor any of my heirs or representatives will have power to raise any objection to the present agreement. All disputes about such lands will henceforth be adjudicated by the Government without my interference. This is on the understanding that my heirs shall receive from Government half the rents derived from such lands; and that should no rent accrue, no claims on my part for rent shall be accepted.

"Without the permission of the British Government, neither I nor my heirs will have the power of transferring any lands in the said ilaqua either to Englishmen or Bengalees.

"In case of my doing so, the lands will be liable to seizure by the Government.

"*Dated* 15*th September* 1859.

"*P. S.*—The agreement and the timber forest for that ilaqua, which was given by me, will also remain in force.

"CHOOTOO SING, *Rajah.*"

6. It would appear from the postscript that some agreement had been previously made, which is again confirmed; but this former agreement cannot be traced.

7. There is no record of anything having been done with the forest until 1863, when it was leased to a Mr. Bainbridge for five years at a yearly rent of Rs. 100.

One Bhakut Sing of Moyrapore was allowed to work it for his own advantage during this time; but what he paid to Mr. Bainbridge for this privilege is not recorded. Little appears to have been done with the forest at this time. At the expiry of this agreement the forest was sold, in 1868, for three years ending April 1871, to one Chand Rae of Nung Khlow. The sum paid for this lease was Rs. 150 per annum. The forest was sublet during this period to Totee Ram, a native of the plains, for Rs. 400 a year. This man appears to have become aware of the value of the forest, and set himself to work it as far as his means admitted. At the end of the lease, April 1871, having, as he states, some 1,200 logs felled in the forest, and 300 boats made of Sâl ready to remove, he was anxious to renew the lease, and applied jointly with the Jeerung sirdar, who also began to see the value of the timber, to the Deputy Commissioner for a further lease, offering this time Rs. 2,400 for a three years' lease. The matter was referred to the Commissioner, who has declined to approve of any lease being given until the Forest Department has reported on the subject. The matter is now under consideration. The forest appears to be of some value, and covers a considerable area, having good water-carriage for timber.

8. It will be inspected and valued early next season by a forest officer. Meantime, probably, some temporary arrangement for one year will be made by the civil authorities, under which the timber felled and boats prepared will be taken over by Government, the man Totee Ram receiving some consideration for the work done by him in felling and preparing the timber now lying in the forests, though he has no right whatever to claim anything, as he may be found useful as a contractor to remove the timber to depôts hereafter. It would appear that the agreement entered into with the Rajah was not with a

view to profit which might be derived by Government, but to assist the Sirdar, and let him derive some of the advantages that would accrue from a proper management of the forest by Government. Under these circumstances, any arrangement made should be of a liberal nature, suited to the spirit of the agreement entered into, yet such as will protect the forest from destruction.

9. The neighbourhood of this forest to our Kamroop Dooar forests has given us some trouble in protecting the latter, as it is difficult to prove, in case of plunder of our forests, whence the timber brought down comes. The Jeerung forest should be made over to the Forest Department, and probably the best way of dealing with the "Rajah" (?) would be to agree to pay him a fixed yearly sum instead of half profits, so that his finances might not be subjected to periods of interruption when no profits accrued.

Bhaugulpore Forest Division.

10. Inspection of forest in this division was carried on in Hazareebaugh, Lohardugga, and Singbhoom; also in one of the tributary mehals, Gungpur.

Chota Nagpore.—Hazareebaugh Sub-Division.

11. In Hazareebaugh sub-division no Government forests were met with. The Ramghur and Dhunwar estates occupy almost the whole of the district. There is little timber of any value on these estates. The executive engineer still obtains some at the station of Hazareebaugh at comparatively low prices, viz. eight annas per cubic foot for large scantlings; but stocks are reported to be small. If something in the shape of forest management were introduced, valuable forests might probably be formed at little cost, for young Sâl is seen growing over large tracts; but none of it is enclosed, and thus it is all kept down by unceasing collection of charcoal (made in a most primitive and wasteful manner) and firewood over the whole area. If certain tracts were set apart periodically for these supplies, while others were hedged in or enclosed for a certain number of years, all trespass within them being prohibited, tracts of forests would be formed for future supplies of timber without any present decrease of revenue derived from charcoal and firewood pottahs. Few trees are seen over the whole of this district except the wretched Salee (*Boswillia Glabra*), left on the hills owing to its perfect worthlessness. It is not even used as firewood. A gum, it is said, can be extracted from it; but nothing appears to be known of its properties in the district. Wood is scarce, and is rising in price. Within the last five years the value of Sâl saplings has doubled.

12. At Lillagun a quantity of young Sâl from the Ramghur estate (Echack) was met with. It was going down to Gya for sale. These saplings, purchased from the estate agents at Rs. 2-8 per 100, fetch in Gya Re. 1 to Rs. 1-8 each. There is room here therefore for improvement of revenue paid to the estate, as the cost of transit to Gya is small.

13. In a letter from the Commissioner of Chota Nagpore (No. 1297 of 12th May 1870), it was reported that seventy-seven patches of Sâl, covering an area of 2,362 acres, were reserved on the Dhunwar estate; but after inquiry they proved to be private property, and the estate under management by the Court of Wards, so that no interference with them on the part of Government can take place, except in the shape of advice to the Agent if asked for. These patches should certainly be protected and extended gradually, which could easily be done.

Lohardugga.—Palamow Sub-Division.

14. The first inspection tour of this sub-division began at the junction of the Koel and Soane rivers up to Daltongunge, and thence on through the district in a southerly and easterly direction, ending at Hazareebaugh.

15. This sub-division bears evidence in almost all parts of its having once contained very extensive Sâl forests; but all timber of any size may be reported

as having entirely disappeared. The Public Works Department, being much in want of timber for the irrigation works now being carried on both east and west of the Soane, obtained the permission of the Government of Bengal in June 1869 to work the forests in this district, as there was not then any forest establishment appointed to it. They explored the country along the Koel and also the Kymore range, and came upon a forest near Kamunday and Gunkter, on the banks of the Koel, where 800 dead Sâl trees, standing in paddy-fields, had been reported, as also some timber of large size standing in the forest around. The timber is, however, very inferior in quality, and very deficient in quantity, so far as the Government lands are concerned. The distance it has to be taken to the Soane, about 100 miles by cart, will also make it very expensive.

16. A good deal of Koossum (*Schleicheva Trijuga*) and other wood is available on private estates on the banks of the Koel, lower down which the Public Works Department are felling and sawing up, chiefly on river-banks.

17. They obtain this timber from the owner by paying a fixed charge per axe used in the forest during one felling season.

18. As there is no stipulation made that only such timber as can be taken away during the season is to be felled, the proprietor of the forests has rather a bad bargain, as the axe is set to work very freely, and the timber cut is subsequently taken away at leisure.

19. In order to save some of the growing Sâl in the district from destruction by the inhabitants, who joom the land, the Assistant Commissioner at Daltongunge, during a late settlement of the Government lands in the district, set apart certain blocks in each farm, to the extent of some 149 square miles, as Reserves, in which no cultivation is to be carried on. These blocks are covered with young Sâl, and, if left to grow, will certainly hereafter produce valuable timber. But the Koel being useless for rafting purposes, owing to the quantity of rocks in its bed at various places, and the rushes of heavy water which during the rains come down it, so as to render navigation of all kinds very dangerous, timber in these localities is comparatively of little value except for local purposes.

20. These demands, however, deserve attention, as they will probably be considerable hereafter, when the mineral wealth of this district, which is believed to be very great, shall have been opened out, and stocks of timber in the neighbourhood will be very valuable.

21. For these, as also climatic reasons, areas of forest covered land should be suffered to grow.

The Assistant Commissioner was addressed on the subject of restricting the inhabitants to cultivating within certain defined areas, giving them land enough to allow of a cycle of five years' rotation of cultivation.

On this subject he reported that in his opinion it would not be advisable further to interfere with the people at present. They had grumbled at the Reserves already made, and if interfered with further, might possibly leave the district altogether and go into the neighbouring tributary mehals of Sirgoojah and Jushpur, where they could get as much land as they liked without any restrictions at all.

22. These objections are sufficiently strong to render it unadvisable to do more at present than protect the blocks now reserved; but should not joomeahs, wherever found, be gradually brought to cultivate within certain boundaries, which might periodically be curtailed until they leave off their nomadic mode of life—one which induces idleness and proverty—and become settled, industrious, and useful members of the community? Jooming to the tribes settled on the hills and mountains, where the plough cannot be used, is *a necessity* to their very existence, for they cannot be expected to use the hoe

where there is abundance of land for them to roam over without any injury to any one (the richest forests being valueless unless so situated that the timber can be profitably extracted); but the matter is different in the plains, where jooming is not necessary, and induces idleness and poverty.

23. Measures have been taken to get the reserved blocks above referred to mapped, and the orders of Government will be obtained regarding their management, *i.e.* whether the Assistant Commissioner shall be responsible for their protection, or whether the Forest Department should take charge of them. Probably for some years to come the Assistant Commissioner will be best able to protect them, as a forest establishment to look after them would cost very much more than if this were done by the Assistant Commissioner, assisted by periodical visits of inspection by a forest officer during the dry season.

24. At Shapore (Daltongunge) it was reported that during the hot weather the wells were dry, and the only water to be got was from the Kool. The new Forest Bill will perhaps be useful on this point, if scarcity of water arises from both clearing of forest and felling of all timber on the banks of the streams.

25. The Government of India drew the attention of the Irrigation Department in September 1870 to the felling of Koossum, before mentioned, which grows along the banks of streams, and should be preserved so as not to lay them bare.

26. At present, on private estates the felling of trees on river-banks cannot be interfered with, although this practice not only affects the supplies of water, but also injures the water-ways, owing to the branches and trunks of trees falling into the rivers and forming snags as also sand banks. No timber should be felled on the main banks of the streams, at least within 100 feet of the water's edge. Orders exist, issued by this department, to this effect; and only in exceptional cases, such as there being some fine tree near a river, the removal of which would in no way expose the bank, is felling allowed. These orders have not been strictly carried out at present, as supervision has been impossible; but they are gradually becoming known, and will be acted up to as conservancy is better understood.

27. A good deal of Khair (*Acacia Catechu*) was met with on the inspection tour; but the trees have been so frequently cut over and so much injured, that none of them at present produce any cutch. It was reported in the district that a certain class of natives used formerly to come into the neighbourhood every cold season to chop up and boil down the wood, but that this manufacture had latterly entirely ceased.

28. A second tour of inspection, by the Assistant Conservator only, was taken from Hazareebaugh to Ranchi, and onwards to Chyebassa, where the Lohardugga district joins Singbhoom; also from Borunpahar towards Sumbulpore for twenty miles, but no Government forests were met with. What forest there was, belonged to zemindars.

29. This district was traversed from Bandgaon, forty miles from Ranchi, to Chyebassa, through the sub-division of Sarunda to Saitha village.

30. Between Bandgaon and Kenaghat some fine forest of Sâl was seen, but it all forms portion of the estate of one Urjoon Sing of Porahaut, now a State prisoner at Benares. This estate has during his life-time been sequestered, and is to be returned to his family after his death. At least this is what the people in the neighbourhood stated.

31. Near the village of Saitha, Sâl forest was met with, which is the property of the Government. It is situated in the Kolhan country (the country of the Kools). The tract of country is hilly, and water-carriage for timber distant and bad.

The forest itself is poor, and needs for the present, its existence having been recorded, no further notice here.

32. Near Goilkera, and on to the banks of the South Koel, some very fine forest of Sâl was met with. This is also the property of Urjoon Sing.

SARUNDA.

33. In Sarunda Government is the zemindar, and here at last Sâl forest which could be at once taken up for conservancy and working was found. The area of forest in Sarunda is about 500 square miles.

34. Here, strange to say, jooming does not appear to be the mode of cultivation.

Destruction of another kind, not however so bad in its effects as jooming, though still very destructive, has gone on. The Sâl trees have been tapped to produce a species of resin, the value of which is only Rs. 2 to 3 per maund; and as a tree produces only about one seer of resin, some forty to fifty trees are destroyed for Rs. 3 worth of resin.

This resin collection was stopped by order of the Government of Bengal in March 1869, on representations of the Deputy Commissioner.

35. Almost the whole area of Sarunda is forest, and is available for forest conservancy purposes. Means of exporting timber, easy; navigable streams, good;—the South Koel,* Karo, and Brahminee.

"From Udsu I (Captain Losack, the Assistant Conservator) came by river to Garjan, on the Brahminee, easily in the month of March, and am confident that there would be no impediment to rafting timber immediately after the rains as far as Bonai, about twenty-five miles below Garjan." From here it could be easily taken on down the Brahminee, as large boats navigate this river up to that point at all seasons.

* *Note,*—This is not the Koel referred to in the Palamoa district, which for distinction may be called the North Koel, as it runs to the north, while this Koel runs to the south and south-east.

36. But the value of the timber, it is feared, is very much reduced, owing to the distance of large markets. Unfortunately the Brahminee flows into the Bay of Bengal at False Point, whence to ship it would be expensive. Possibly some other way may be found of taking the timber during the rains through creeks towards the Damooda.

37. The Assistant Commissioner will be deputed to explore the country and make full inquiries on the subject this season. The South Koel is also good for rafting. Timber has been rafted to Cuttack from Sarunda.

38. It appears from a letter from the Deputy Commissioner that the inhabitants have no rights to any farming produce except for their own farming purposes.

39. No regular valuation survey was made in these forests this season, but the Assistant Conservator reports that two trees of first class timber per acre may be estimated standing in the forest. Even if this estimate be reduced to one-fourth, or two trees to four acres, this would still show a very large stock of first class timber available for removal.

40. The stock of girdled trees ready is estimated at thousands, so great has been the killing of trees through resin-collecting. A close inspection and valuation of this forest will form one of the first operations for next dry season; and meantime all information regarding cost of removal and markets, together with price to be obtained, will be collected.

41. The Deputy Commissioner will be applied to so that some protection of the forest may be exercised pending arrangements for putting it in charge of the Forest Department, after the maps now being prepared have been completed, and transfer of the forest has been approved by the Commissioner of the division. In the meantime a small establishment, under orders of the Deputy Commissioner, but paid out of the forest establishment sanctioned for this division, will be stationed in it if deemed necessary, as it is not advisable to place isolated native establishments in charge of forests at a distance from reach of an

European officer, for they are apt to spread reports which unsettle and alarm the inhabitants (who are generally timid and ignorant people) instead of instilling confidence among them.

TRIBUTARY MEHALS.—GUNGPUR.

42. A trip was taken into this territory, which is on the borders of Sarunda. It contains much fine Sâl forest, with a good stream for transport purposes; the Sunk and Kool clearances for cultivation are destroying parts of the forest.

If found advisable hereafter, something perhaps may be done in the way of leasing portions of these forests. The proprietor does not appear to work them, and is probably not possessed of the capital to do so.

PATNA DIVISION.—GYA SUB-DIVISION.

43. This sub-division was crossed by the grand trunk road from Burhee to Dehree. A short halt was made at Sherghotty to inspect land between the Moorhur and Silajun rivers, close to Shergotty, which had been reported as suitable for plantations. On reference to the Assistant Commissioner at Sherghotty it turned out that the land has been granted to cultivators on various leases and settlements.

44. It appeared to be suitable for Teak plantation; and if areas of sufficient extent can be obtained at reasonable rates, portions of it might with advantage be taken up for this purpose. The subject will be referred to again in Section 3, Plantations.

There are no forests whatever in this tract worth notice.

SHAHABAD SUB-DIVISION.

45. So much had been verbally reported regarding forests in this district, and especially on and near the Kymore Range, that a special point was made of visiting it. But great was the disappointment experienced, in crossing the Soane at Dehree, to find on the march up to Akberpore that the sides of the hills were only covered with small bamboo, and that no tree forests existed anywhere about.

Everything in the shape of forest has disappeared, and the irrigation works are using up as tramway sleepers, and for other purposes, the remaining saplings of various kinds of trees, the only remaining representatives of the formerly existing forest.

46. This district formerly produced very fine Ebony, of which specimens were shown by Mr. Davis, a resident of Akberpore. Here specimens of some other beautiful woods were shown by Mr. Davis that had many years ago been obtained from the Kymore Range; but forests in which they grew are gone, and the few saplings of these trees which remained a short time ago are now lying on the ground as sleepers, on which stone is carried for the works from the hills.

47. When the plateau on the top of the range was visited, the same disappointment was experienced. Except some small patches of Sâl forest in an almost inaccessible place for working, there appeared to be no forest on the plateau. This tract had been gone over by the engineers of the irrigation works in search of timber, and had there been any of value, they would not have gone 120 miles off near Sirgoojah for timber.

48. On the road up to Akberpore, and towards Daltongunge, quantities of Koossum posts were met with being taken down by bullocks for the irrigation works. The posts (value Rs. 2 at the works) were all young saplings, about 10 feet long. The denudation of river-banks under these supplies may be judged of, but of course the works must be provided with wood.

49. The following is a list of some of the trees met with in the Chota Nagpore district, drawn up by Captain Losack, the Assistant Conservator:—

No.	English.	Systematic.	Local.
1	Babool	Acacia Arabica	Babal.
2	Khair	Acacia Catechu	Khair or Kheira.
3	Siriss	Acacia Speciosa Sirissa	Siriss.
4	Bail	Œgle Marmelos	"Bel" or "Loagsee."
5	Jack-fruit tree ...	Artocarpus Indica	"Kuttal" or "Porsoo."
6	Neem	Azadirachta Indica	Nim.
7	Mowah	Bassia Latifolia	Mowah.
8	Cotton tree	Bombax Malabaricum	"Semul" or "Edel."
9	Dhak	Butea Frondosa	Porassie.
10	Amultas	Cathatocarpus Fistula	"Sanal" or "Haree."
11	Toon	Cedrela Toona	Toon.
12	Dhan	Conocarpus Latifolia	"Dho" or Hesel.
13	Sissoo	Dalbergia Sisso	"Pea Sal" or "Heet."
14	Ebony	Diosphyros Speciosa	Keond.
15	Aonla	Emblica Officinalis...	"Aola" or "Merel."
16	Pepul	Ficus Religiosa	"Pepul" or "Hessa."
17	Pakkar	Ficus Venosa	"Parkur" or "Laru Hessa."
18	Gambar	Gmelina Arborea	Kasuar.
19	Mango	Magnifera Indica	"Am" or "Lili."
20	Horse radish tree ...	Moringa Pterygosperma	"Sagna" or "Mulga."
21	Koossum	Schleicheva Trijuga	"Koossum" or "Baroo."
22	Sâl	Shorea Robusta	"Sarjee," "Sal," or "Sakooa."
23	Jamun	Syzygium Jombolanum	"Jamun" or "Koda."
24	Tamarind	Tamarindus Indica	"Teetool" or "Tojo."
25	Urjoon	Terminalia Arjuna	Gara Hatua.
26	Hur	Terminalia Chebula	"Hurtokee" or "Kola."
27	Asan	Terminalia Tomentosa	"Usun" or "Hutna."
28	Bair	Zizyphus Jujuba	"Kul" or "Bakra."
29	Kamela	Kottlera Tinctoria	Sindwah
30	Sallee	Boswillia Glabra	Sallee.

Bhaugulpore Division.

50. In this division the Government estate of Damin-i-koh in the Sonthal Pergunnahs was surveyed by Mr. Reid, the Supernumerary Conservator temporarily attached to Bengal. The district is divided into three damins, viz. the Doomka, Godda, and Rajmehal damins.

51. The area is about 1,300 square miles. A range of hills not exceeding 1,800 feet in height runs down the whole length of it, throwing out lateral spurs east and west.

52. The Doomka damin comprises the southern portion of the district between the Brahminee and Bunslol rivers. The Godda damin extends along the western face from the Bunslol to the northern boundary. The Rajmehal damin extends from the Bunslol to Sahibgunge, along the eastern portion of the district.

53. The estimated area covered with forest is stated to be 119 square miles, of which 70 square miles is Sâl. The other timber trees met with in the district are reported as Passur, Latsar, Sissoo, Asun, Dhan, which are all more or less valuable for domestic purposes.

54. The situation of these tracts between the Chord and Loop lines of the East Indian Railway, added to their being irrigated by streams down which timber can be taken to the Ganges, renders them of very great value. There are, however, several great difficulties connected with a plan of management of these forest tracts arising out of political and other reasons, such as the distribution of villages throughout the Sâl tracts and the rights of the Paharia and Sonthal tribes who inhabit the country.

55. There is not much mature timber for present felling, but there are large tracts covered with young Sâl, which, if saved from periodical destruction, will be of immense value hereafter.

Mr. Read's report, as also that of the Commissioner of the division upon it, are now under consideration of the Government of Bengal. Such tracts as can be set apart without disturbing the minds of the inhabitants will probably be reserved, and the inhabitants will in time be educated to see that so far from conservancy of forests injuring them, it will turn out to be a source of employment for their labor, and benefit them in many ways.

56. There has certainly been very extensive clearing all over the district; the banks of streams are said to be laid bare: and the country must gradually suffer unless measures are taken to save the Doomka and Godda damins from the fate of the Rajmehal damin, which is thus described:—

"The entire aspect of the country to the north of the Gumani river is wholly changed, owing to the hills being so completely denuded of all indication of forests. The slopes are for the most part covered with a stunted species of scrub jungle, through which the sun easily penetrates, and fully accounts for the numerous dry beds of water courses, that are so often met with in the valleys."

57. Such complete clearing of a country, there is no doubt, affects its water springs, and must bring it to desolation. The Rajmehal Damin contains only six patches of Sâl forest, area about 4¼ square miles. Every traveller, who has passed up the East Indian Railway between Teenpahar and Sahibgunge will endorse the description of the Rajmehal damin here given.

58. The following statement, which accompanies Mr. Read's report, gives much local information concerning the distribution of the district under cultivation, forest, and waste.

Name of Locality.	Sonthal cultivation.	Paharia cultivation.	Rocky ridges and river beds.	Forest not Sâl.	Sâl forests.	Total.
	Sq. Miles.	Sq. Miles.	Sq. Miles.	Sq. Miles.	Sq. Miles.	Sq. Miles.
Doomka damin	7·30	21·33	7·30	14 60	21·90	73·00
Godda „	8 80	22·00	2·00	33 00	44·00	109·80
Rajmehal „	.....	.....	.....	.....	.....	.....
Tract No. 1	.....	10·00	.....	.....	1·25	12·00
„ „ 2	·16	·29	·60	1·35	·60	3·00
„ Nos. 3 and 4	.....	.....	·50	.....	1·50	2·00
„ No. 4	.....	·25	1·25	·50	·100	3·00
Total ...	16 26	55·19	11·65	49·45	70·25	202·80

59. Mr. Read's report is very full of information; but as the Conservator has not been able to visit the district himself during the year, and he can form no opinion regarding it, it is not deemed advisable to attach it to the annual report. It can be published hereafter, with correspondence and orders relating to the forest conservancy to be introduced into this district.

Cooch Behar Division.

60. In the Cooch Behar division examination of forests was confined to inspection of the tract called the Dulka Jhar in the Terai, and some patches of Sâl forest, the property of a zemindar who had offered them for sale to Government.

61. The Dulka Jhar, which up to this year appears never to have been explored, was reported to be a perfect den for wild beasts, and the seat of malaria, which was disseminated through all the surrounding districts. The Deputy Commissioner reported that cultivators dreaded its neighbourhood so much, that large tracts of land, which would otherwise be cultivated, remained waste, and that the wild elephants it harboured destroyed the crops. Under these circumstances, and the fact that application has been made to purchase it from Government, it was deemed advisable to have it explored.

62. For this purpose the Assistant Commissioner was desired to clear two lines at right angles 15 feet wide through the tract, and report as to its value. This work was done, but the present value of the tract as a Sâl forest appears from the report to be anything but satisfactory. It contains no timber of value for present felling, and a large portion of the tract, which covers an area of 5,059 acres, is low and swampy, containing heavy masses of valuable cane brake. It will, however, probably become of considerable value hereafter if closed for forty or fifty years, as most of the Terai Sâl forests must lie, owing to their having been almost completely cleared of all mature timber by contractors, who made large fortunes previous to the introduction of forest conservancy.

63. It is proposed to clear lines through the reserved Sâl forests in the Terai and Bhútan Dooars gradually every year. It is known that the Terai tracts have been cleared out of large timber; but there is still some in them suitable for local purposes, which will pay the cost of these clearances, and they should be made not only for the purposes of exploration, but for gradual improvement of the tracts and communication through them.

64. In the forests of the Bhútan Dooars there are still considerable stocks of valuable timber, and opening out lines of communication in them is necessary to their systematic and proper working.

Chittagong.

65. The Government forests in this division were notified in the *Calcutta Gazette* of 1st February 1871. They extend over an area of 5,670·5 square miles.

66. They are situated almost entirely within the Hill Tracts, and their boundaries at the foot of the hills are nearly identical with these tracts. Natural boundaries, such as water-sheds of ranges and rivers, have been taken to define the other boundaries.

67. Two tracts, as defined below, are proposed as reserved tracts, viz.—

1st.—The Kassalong Reserve; area, 875 square miles.

North.—Hill Tipperah and Cachar.

South.—The Kurnafoolee river from Kassalong to Burkhal Falls.

East.—The Burkhal and Sirthoy Thlang ranges.

West.—The Myanee and Kassalong rivers.

2nd.—The Soobalong Reserve; area, 91 square miles.

North.—The Burkhal Tong.

South.—The head-waters of the Soobalong river.

East.—The Sychal range.

West.—The Soobalong river.

68. No demarcation of these tracts will be necessary, the natural boundaries being complete.

Extract from Mr. Davis's report.

69. Inspection of the forests during the past season was carried on in the forests by the Assistant Conservator, Mr. H. H. Davis, who reports, "between the junction of the Soobalong and Kurnafoolie, as far as Bellaissure, a distance of about twenty-two miles, and the tract between Kassalong and Kharkhorea, about thirty-six miles, as well as the forests bordering on the Kassalong between these places and those along the Kurnafoolie as far as the Burkhal Falls. The cuttings that have been carried on during past years have told very much on these forests, and timber is very scarce in places where it has been easy to get out, the borders of streams being entirely denuded; whilst further inland, where the woodman has not been able to get out a log, the boat-digger or surveyor has taken his place, and everywhere the most valuable trees have been taken out, whilst the more abundant and fast growing kinds, such as Gurjun, are still plentiful. Toon has been nearly eradicted, and other kinds of valuable woods have only just been saved in time. Had unlimited cutting continued for five years longer, I venture to say mature Jarool, Chaplis, and woods of a similar class, would not have been found in the forests bordering on the Kurnafoolie or Kassalong rivers."

70. He goes on to state that he would have made a point of inspecting very much larger tracts of forest both on the Kurnafoolee and other rivers, but without police escorts and elephants it would have been quite useless to attempt getting into the interior, as he would have stood a fair chance of having his party of men cut up by Kookies in the first place, and secondly he would not have been able to procure supplies after he had once started.

71. Application for police escort was made some time previous to the season for inspecting the forests, but the district police were all required for special duty, and no escort could be granted.

72. It was impossible to find elephants in the district; but the purchase of elephants has been sanctioned by Government, and elephants will be provided next season.

73. "Within the Government forest boundary lines there are no private forests. On zemindaree lands in the regulation district there are small detached forests containing timber trees and bamboos; and on the tea estates owned by Mr. Windram, at Ramoo, and Mr. Macalpin at Femoa, there are some fine forest trees; but the whole product of these private forests combined would not supply the requirements of Chittagong and adjoining districts for more than two or three years at the outside."

74. The following rivers are used for floating down timber and other forest produce, and should be kept open for such, viz.—Fenny, Kurnafoolie, Surta, Droong, Huldah, Essamutty, Seelak, Chingree, Soobalong, Kassalong, Sungoo, Daloo, Mamoree, Eadgong, Bagkhalee, Razoo, and Nauf.

75. All the forests in the division are of a mixed nature, the kinds of trees found in those situated to the south differing from those in the north, near Kasalsong.

Dacca.

76. The Dacca division still remains unexplored, as the officer appointed to it this year resigned his appointment early in January, and it has been impossible for the Conservator to visit the division during the year.

77. The unsettled state of the tribes all around will probably defer any conservancy measures in this district except for local purposes, and for these they are more than abundant; its forests have probably little present value, owing to their isolated situation, cut off from all possibility of bringing the timber from them to a profitable market.

SECTION II.

Reserves.

78. There are no additional Reserves to note as having been made during the past year.

Bhutan.

79. A list of forest tracts proposed as Reserves in the Bhútan Dooars, together with their boundaries, as approved by the Commissioner of the division, containing 3,398 square miles, was given in the report for 1869-70. They have not yet been notified in *Gazette*, or been transferred to the Forest Department, which is, however, in charge of them, as the time for appeals in case of private rights in the forests under Act. XVI of 1869, called the Bhútan Dooars' Act, has not yet elapsed.

80. Very little permanent demarcation of boundaries will be necessary, as they are for the most part either natural or the fixed local boundaries of mouzahs.

Assam.

81. In Assam the selection of Reserves has not yet taken place. The forests have all been inspected, but the revenue survey maps of the country not being yet complete, it has not been possible to define the forest tracts sufficiently to enable the Commissioner to approve any proposals made to him on the subject.

82. In June 1863 the Nambur forests in the Seebsaugor district were notified as Government Reserves, and were made over to this department in January 1869.

83. The Dooars in Kamroop were at the same time reserved from sale as waste lands, but the boundaries of these forests were not settled, as they had not been surveyed.

84. Besides these, a great number of tracts of country were notified as reserved from sale as waste lands on account of their containing rich forest, and many of these will eventually be included in Government forest tracts.

Chittagong.

85. In the Chittagong district it is proposed to reserve two tracts situated within well-defined natural boundaries, approved of by the Commissioner of the division, on the Kassalong and Soobalong rivers, which flow into the Kurnafoolie, some little distance below the Burkhal Falls. Estimated area, 900 to 1,000 miles. The timber in these tracts has been a good deal worked out, especially along the river-banks; but the tracts are well situated, and having contained very fine timber formerly, will, if closed now for a period, no doubt reproduce considerable

supplies for future years in addition to the reserved timbers which will be protected in the tracts which were notified as Government forests on 1st February 1871.

86. The unsettled state of the wild tribes, which surround British territory on all sides, renders it necessary to use great caution in enforcing any restrictions in the forests, and thus protection of them is difficult and action in them much restricted.

87. The only measure of protection that has yet been taken in the area of Government forests in Chittagong division already notified, has been to prohibit the "Capitans" of gangs of wood-cutters, who go up yearly into the forests for timber, from cutting trees below a given size, and thus to protect the young timber. This subject does not properly belong to this year's report, as the measure only took effect from the 1st of April 1871, when the river toll stations were made over to the officer of the Forest Department for collection of the revenue as sanctioned by Government; but it is perhaps as well to mention it here to show that measures were at once taken to introduce some means of protection to the forests, and this is one which does not affect the district inhabitants of the hills. It only affects the native class of wood-cutters in Chittagong, who have derived very large profits on the timber they have hitherto brought down, paying a mere nominal toll on the rivers to Government for it. The tolls now levied under Government sanction dated 27th January 1871 are somewhat more in proportion to the value of the timber brought down.

Sikkim.

88. It was not possible during the past year to do more than commence regular valuation surveys of the Reserves referred to in paragraph 17 of last report. One tract, the Dulka Jhar in the Sikkim terai, containing 5,059 acres, was inspected. A detail of inspection has been given in Section I.

Bhutan.

89. In Bhútan Dooars there is still some first class timber fit for removal, but the expense of removing it is very heavy. Examination of these Reserves should steadily go on every season, such trees as are fit for removal being at the same time marked by departmental officers. These will probably suffice for all local demands, and the tracts, as thus cleared, will be closed for a period of years, until such time as they have recovered themselves from the effect of the exhausting supplies which they were made to furnish during late years, previous to the introduction of a conservancy establishment in the Lower Provinces, Bengal.

90. Amongst the tracts of land in Sikkim made over to this department when first introduced in the district, there are some which have since been found to contain little or no timber, and also to be so situated as not to be of any value to the department for plantation purposes. These the Commissioner of the division wishes should be restored to the revenue authorities, and accordingly the authority of Government was sought in March 1870 to a transfer of such tracts. On this, two estates of Thurboo and Rungdoo, as containing no timber, and ill situated for plantations, as also a tract on the Tukoor Spur of no value to the department, were during the year given up and struck out of Reserves.

91. Some few more tracts will possibly be made over in like manner; but great care must be taken not to reduce the Government Forest Reserves without due consideration separately of the value of each tract on account of the timber on it, or its suitability for plantations. The tea interests of the district require that a certain area of plantations of Toon and other useful woods for boxes and charcoal should be made every year.

SECTION III.

PLANTATIONS.

SIKKIM.

92. IN Sikkim division there are the following plantations:—

One at Rungbool, area about 450 acres, containing Oak, Chesnut, Walnut, and Magnolia.

93. It was commenced in 1868 and was increased during 1869. Its general appearance in 1870 did not warrant its further extension, as much damage had been done either by cattle or wild animals, by which the tops of the young plants had suffered; and it became a question (should it be found necessary to enclose it by a fence) whether the expenditure on such enclosure would be advisable.

The reports lately received regarding it, however, are favorable, and the work may with advantage be continued gradually year by year.

94. The young plants on the Teak plantation in Bamunpokree, a spur of the Himalayas below Punkabaree, are now reported to be 20 feet high. The seed was put into the ground in August 1868. This was far too late; but the seed obtained from Burmah was delayed on the road. Had the seeds been planted in May, the plants would no doubt have been much higher. From one cause or other, partly perhaps on account of inferior seed and their having been covered too deep with earth, very many did not germinate until the following spring. The same thing occurred again in August 1870, when the plantation was extended, and the seeds are, many of them, only now coming up.

95. As there were plenty of seedlings to transplant at commencement of the rains of 1871, and seed from Burmah carefully chosen and packed in tin was received early this year (in April), it is hoped that the Assistant Conservator, who had early instructions on the subject, will be able to carry out the instructions given him to increase the plantation as rapidly as possible this season.

96. Toon is to be mixed with Teak in the plantation. This wood is light, and very valuable for many purposes. It is the best for tea boxes. The Assistant Conservator reports that the price of tea boxes in the district has increased from Re. 1 to Rs. 1-12 per box.

ASSAM.

97. In Assam the Teak plantation on the Dehing river, Seebsaugor district, contains plants standing 20 feet high, the seed of which was planted in 1869. This plantation is also being extended this season with seed from Rangoon, and also some obtained from Sherghotty (Patna division).

CHITTAGONG.

98. In Chittagong division land is being prepared for Teak planting, and seed from Burmah has been sent to the local forest officer.

99. The areas likely to be planted this season cannot at present be stated.

100. All these plantations can be extended over considerable areas hereafter, if it is deemed advisable to do so.

GYA.

101. It was hoped that a Teak plantation could have been commenced near Sherghotty this season on land which had been reported as favorable and available for the purpose. The tract was visited in January 1871, and

is certainly favorable for such plantations; but it was found hopeless to plant them this season, as the land is not available, except it be taken up under Act X of 1870.

102. It is worth remarking here that in the compound of the court-house at Sherghotty there are some third class Teak trees, the seeds of which germinate under the parent trees as thick as they can stand together, completely covering the ground, and that there are several specimens of fine young saplings around. Such a sight, although the Conservator has travelled over all the Teak tracts of British Burmah, he never saw before. It seems uncertain where the seed of the original trees was imported from. Some persons said from the Madras presidency, some from the upper waters of the Soane, where small Teak is met with. At any rate, the seed has found a genial and fruitful soil, leading to the inference that the neighbouring land is also very well suited to the growth of this kind of tree. The soil was inspected and found to be a rich sandy loam well suited to Teak. The country around is partly cultivated, but large areas could be obtained for plantations. It is sufficiently undulating for rain to run off the surface readily, which is a very important point, as standing water is very unfavorable to the germination of Teak seed and the growth of the young plants.

Sites for Plantations.

103. Here extensive plantations might be carried on should Government decide to commence such work on the submission of proposals on the subject.

104. On the Kool, near its junction with the Soane, there is also suitable land, and large areas might be advantageously taken up for plantations; and in Assam, on the high level lands at the back of the station of Bishnath, there are 7,000 to 8,000 acres of splendid land, the property of Government, suitable for the same purpose.

105. The great advantage of these sites does not only lie in their position, which is such as to render supplies of timber to all parts of the Lower Provinces easy and at low rates for transport, being situated near large navigable streams; but in their surfaces, being such that the road steamer, now coming into such general use, could here be employed for ploughing and preparing the land at one-eighth the cost of coolie labor, and at ten times the speed which could be obtained from manual labor.

Road Steamer might be used.

106. In a report on the subject of a trial on the estate of the Earl of Dunmore in March last, it is shown that after allowing 10 per cent. for outlay and wear and tear, and including all expenses connected with the engine, 5 acres of heavy and 7 acres of light ploughing can be done per day for 19*s.* 9*d.* or 3*s.* 2*d.* per acre. In Assam the cost of preparing land for tea cultivation is between £2-10 to £3 per acre. The expenses of a road steamer and plough would not be very much greater in this country than they are in England, as only three persons are required to work it, viz. an engine driver, a boy, and ploughman, and fuel would be always at hand. The cost of a road steamer, made with extra strength for this country, with roof to protect driver from sun, and with complete duplicate set of working parts, would be £950 in England, and a five furrow plough £70. Doubling all expenses in England (19*s.* 9*d.* per day for 5 acres), and estimating cost of work at £2 per day for only 4 acres ploughed (instead of 5 or 7 per day), we have a cost of 10*s.* per acre for ploughed land, after which, for tree plantations, little is required but to put in the seed.

Importance of Plantations.

107. If the work of plantations is to be of a satisfactory nature, it must be consolidated and sufficiently extensive to warrant the employment of a special and skilled staff for the purpose of carrying it out. Officers of divisions and

their assistants, where timber operations are carried on, have too much to do to enable them to give the time and attention to plantations which they require. The work is of the utmost importance if taken up at all, as all future supplies depend upon the success obtained.

Cost of Timber from Plantations.

108. It may be well to remark here that timber from plantations, as compared with timber brought from natural forests, will cost probably only one-fourth or less to bring to market. A log from a judiciously situated plantation may cost from Rs. 4 to 5, while from a distant natural forest it will probably cost between Rs. 20 to 30.

109. Thus, while it is necessary and advisable to protect a certain portion of *natural* forest in a country for local use, as also for climatic and other reasons, the stocks of timber in those forests are of value chiefly for local purposes, and while plantations are growing to maturity.

General Observations.

110. It will be found that "protection of the natural forests" in countries like those we have to deal with here (take Assam for instance), should only go so far as prohibiting the felling of under-sized trees of valuable kinds, leaving those of inferior kinds for general local use by the inhabitants of the country. To improve natural forests by planting or clearing, &c., even in tracts of Reserved Forests scattered about a district, if it is to be more than in name, will cost both money and time, which would be far better spent on compact plantations.

111. The small experimental plantations of Teak already made warrant the opinion that this kind of timber can be grown with advantage in Lower Bengal. As regards Sissoo, the trees planted in various parts of Assam lead to the same conclusion, and only scattering of the seed appears to be necessary to increase the area covered with this valuable timber. Toon also grows freely, and is very valuable.

112. It has not been possible hitherto, in consequence of the scant knowledge possessed of the country, and the limited area over which a forest establishment had extended, to frame any general scheme for plantations; but the subject is really one of the greatest importance with reference to future supplies. The increased price of timber, and the decreased size of what is sold, is an evidence of scarcity which cannot be doubted.

113. The Mango plantations of Tirhoot supply at present large quantities of timber, of which the opium factory at Patna uses some 5,000 tons a year, and there are still some stocks of timber on private estates; but these are all fast being used up and destroyed, and planting is not renewing them. Native proprietors are not yet aware of the value of their timber; nor is it likely that beyond a few exceptions Native forest proprietors will introduce conservative measures, except under compulsion, as they care only for present returns.

114. The Bycunpore forest on the Teesta, the property of the "Rycot" of that name, has this year been delivering its last stock of small timber, little above saplings in size. This forest extended over 90 square miles of country, and was favorably situated on the Teesta below the dangerous rapids, where the river issues from the Himalayas into the plains. This is one more example added to the number which have gone before. Attempts were made during the past three years to arrest the destruction of this forest, and to obtain charge of it by transfer or otherwise, but a continued lawsuit as to right of proprietorship has rendered all efforts unavailing. It is now destroyed as a timber-producing tract, and will probably be let out on pottahs for collection of fire-wood and

charcoal, unless some influence be brought to bear on the owners. If closed for a period of sixty years, it would again become a source of valuable supplies. Possibly, when the lawsuit referred to is decided, it may be possible to obtain possession of this property by exchange.

115. The question to be decided is, whether plantations on an extended scale shall be one of the chief works of the Forest Department to ensure future supplies, or whether it shall not. The small plantations hitherto commenced have been only experimental, to test the growth of Teak and the cost of planting. So far it would appear that Teak finds a favorable soil in the damp climate of Lower Bengal, and the cost of plantations may be estimated at between Rs. 25 and Rs. 30 per acre; but the rate would be very much less if consolidated blocks of plantations were made. With the aid of a steam plough to prepare the land, probably the cost would not be over Rs. 10 per acre.

116. Seeing that the Calcutta and neighbouring markets are so easily supplied by sea; that Assam, Dacca, Chittagong, and Bhútan, can supply themselves, it appears only necessary to provide for districts along the Ganges, which are at present dependent on Nepal and imports by sea, which are costly owing to distance of transport by rail. These districts might be hereafter supplied from plantations situated on the Koel, near the Soane, and in the Gya district, where large tracts of land could be obtained.

On Bamunpokree and Merig estate plantations would supply Sikkim.

117. This subject will form matter of special proposals for consideration of Government.

SECTION IV.

Yield of the Forests.

Assam.

118. In Upper Assam timber operations were opened out on the Debroo Nuddy, on the Dehing river, and also on the Dhunsiri.

119. The following report lately submitted to Government will show the nature and extent of the operations, which are of a tentative nature, to test the price at which timber might be extracted, the labor available, and the means of floating at hand. No estimate regarding the value of the forests as sources of supply other than for local purposes, or plan of working them, can be formed unless an experiment has been tried. The local demands are considerable, but they are not at present supplied from the forests of the country. The wood for tea boxes comes from Burmah, Chittagong, Kooshtea, &c., while immense tracts of virgin forests stand around almost untouched, except by the nomadic cultivator, who burns them down. It is evident that we should at any rate endeavour to obtain these supplies from local sources; and more than this, we should see whether these tracts of forest covered land may not also be turned into sources of profit by taking the timber to other than local markets.

120. By doing this the Forest Department is endeavouring to open out fresh sources of supply—a work just as important as the protection of forests—and also husbanding other resources.

It is hoped and believed that eventually the rich forests of Assam will be profitably worked, but there are very many difficulties to surmount.

A class of foresters has to be created. European enterprise in forestry has to be shown the way, and this must be done by Government taking the initiative. Success in a pecuniary point of view cannot be looked for from a first or second experiment; but gradually expense in bringing timber out will decrease, and it will be found that supplies from Assam can be profitably exported.

Cooch Behar.

121. As a considerable quantity of timber felled during previous years, and sleepers, remained in the forests, instructions were issued forbidding the felling of any timber during the year, and desiring that all work should be concentrated in bringing in the felled timber to station depôts. The Assistant Conservator was also desired to inspect all the places where stocks of timber were lying in the forest depôts and ascertain the quantity. This very necessary inspection was ordered in 1868-69, but was neglected by the officer who relieved Mr. Mann on his transfer to Assam (Mr. Oakley). He neglected it again in 1869-70. His supineness in this and irregularities in other matters caused his removal from the division, and he has since left the department. His successor, Mr. James, was instructed to verify the stocks of timber said to be lying in the forests. This has in a measure been done, but has not yet been completed.

122. More than usual difficulty was experinced during the last season in obtaining carts for transport of timber, owing partly to their being employed in carrying the iron bridges for the Silligoree roads, as also for "metalling," and a large number of carts were employed removing timber from the Bycunpore forest, this being the last year before expiry of the lease which had been granted by the owner.

123. The following Statement shows the quantity of timber brought in :—

Sub-divisions.	To Station Depots			To Forest Depots from forests			Total			Grand total.
	Logs	Pieces	Sleepers	Logs.	Pieces	Sleepers	Logs	Pieces.	Sleepers	
Sikkim	7	... ..	50	...	222	1,506	7	222	1,556	
Bhutan	10	90	... ..	2,717	349	11	2,727	439	11	
Total ..	17	90	50	2,717	571	1,517	2,734	661	1,567	4,962

124. The total of timber in the station and forest depôts is shown in Statement No. 25.

Losses of Timber.

125. The following losses have to be recorded for the past year. They are much to be regretted, and the more so as some of them were preventable if proper caution had been observed.

Three thousand sleepers were burnt at Sookna by a jungle fire in March 1870, but the number could not then be ascertained, and they were not therefore struck off stock last year. This loss might have been avoided had care been taken to cut the surrounding jungle.

One thousand four hundred and seventy-six sleepers were carried away in July 1870 by the strong floods on the Mahanuddy during the storms which then occurred. The sleepers had been carted close to the river-bank for a contractor who was at the time rafting and floating them, when the river suddenly, as often happens in the Mahanuddy, came down and carried away a large portion of the depôt in which the sleepers were stocked. Subsequently, after the river went down, many were recovered, but the Assistant Conservator has not furnished a statement in time to give the number here.

Eighty-eight thousand shingles, the remainder of a batch of 470,110 shingles which had been cut for Public Works Department in 1867-68, but which the Executive Engineer refused to take over, should now be struck off stock, as

they have been repeatedly offered for sale where they were lying, on the Rungbee road about four miles from Darjeeling, but no one would purchase them, and they are now useless.

They were not of much value, being those that remained after the good ones had been selected; but this loss would not have occurred had a written agreement been entered into at the time with the Executive Engineer, and the shingles been made over to the Public Works Department in batches of ten to twenty thousand, as the contractors who cut them would have been periodically checked, and the imperfect shingles rejected at the time.

126. It is somewhat unfortunate that soon after the Forest Department was introduced into Sikkim in 1866-67, and before experience had been gained by the forest officer appointed, who had never had any experience in forest matters, a large quantity of timber for the building of new barracks was required, and operations on a large scale were commenced for the felling and cutting of timber. The supply was obtained, but heavy expenses were incurred without written agreements and beyond necessary limits, the results of which are partly seen in the loss of the shingles now recorded.

127. The sales of timber during the year are shown in Statement No. 26.

128. Miscellaneous collections on bamboos, firewood, cattle-grazing, &c., amounted to Rs. 5,771 during the year, being an improvement over previous years.

India Rubber collected in Sikkim.

129. India rubber of very good quality was for the first time collected in this division in the past year. Collecting cost only Rs. 12 per maund as compared with Rs. 25 to Rs. 30, which is paid by the contractors in Assam. About 45 maunds will go down to Calcutta for sale. The sample sent to the brokers was valued at Rs. 45 per maund. Very good stick lac was also collected; and it is proposed to employ some one during the proper season to distribute the insects which produce it over the trees, with a view to increasing the produce.

Chittagong.

130. From the forests in Chittagong the following forest produce is recorded by the Deputy Commissioner as having passed the river toll stations during the year.

131. There is nothing to record regarding other divisions under this section.

Extract from letter No. 119 *of* 9*th June* 1871, *to the address of the Secretary to the Government of Bengal, Revenue Department.*

"Sir,

"As requested in your letter No. 1906, dated 25th May 1871, I have the honor to report on the timber operations being carried on in the Nambur forests, and also on those being carried on on the Deehing and Deebro streams.

"2. Operations were commenced on these streams in March 1870, agreements having been entered into with five Native contractors to fell and bring down logs to forest depôts on the streams at a rate of four annas per cubic foot.

"This rate was considered high, but as no operations of the kind had hitherto been undertaken, the cost of them could not be ascertained, and people were averse to beginning work at a lower rate.

"3. Up to the 1st of April the number of trees felled of various kinds, viz. Sam, Pomah, Urium, Nahor, Makai (good for shingles), have been on the—

	Trees.		Logs.
"Deebroo	50	or	150
"Deehing	284	„	734
"Dhunsiri, Golaghat	176	„	202
Total ...	510	„	1,086

"4. Of the 1,086 logs, 670 had been dragged to the banks of the rivers ready for floating down, and 416 remained still in the forests.

"5. Since that time an elephant has been at work on the Deehing, and has dragged 60 logs, and 120 have been dragged to river by coolies.

"It is expected that the whole of the timber will come to depôts during these rains. The rivers have begun to rise, and the timber is now being brought down to depôts. At Deehing depôt 129 logs have already arrived, and have been dragged up into the forest depôt by elephants.

"6. The elephants here referred to are three, which have been purchased out of eight sanctioned. As inspection of forests by officers was over for this season, I took the opportunity of putting the elephants to work on timber, and I am glad to state that they are doing this work well and beyond my expectations. As soon as proper sample dragging gear has arrived from Rangoon, from which sets will be made here for the use of the elephants, they will be able to work much more effectively, and with less risk of injury, as they now draw from a pad on the back, which is likely to cause hurt, all the weight coming on the backbone; whereas by a flat hemp breast-band, as used in Burmah, where timber dragging is carried on to perfection, the weight comes in front, and does no injury, besides giving the elephant a much better 'purchase' for his work.

"The last reports just received lead me to expect that from four annas the rate will be reduced to two annas or one anna and six pies per cubic foot. The reports say labor can be commanded at very low rates, viz. three annas per day for a coolie and four annas per day for a rough carpenter, and that the villagers in the neighbourhood seem disposed to enter into the work and to carry it on even through the rains.

* * * * * * * *

"10. If this be found practicable, the forests of Assam may yet be found remunerative.

"11. In opening out operations of this kind as a tentative measure, there must be always more or less expense incurred and risk as regards final success; but I am inclined to think that with care the work now going on will be found to be profitable and advantageous, as supplying the demands for timber, and giving data upon which to form opinions as to the advantges of using steam power hereafter."

SECTION V.

FINANCIAL.

132. The financial results of the past year would, so far as receipts and expenditure alone are concerned, have contrasted favorably with the previous year, inasmuch as the deficit is much less; but the difference in the value of timber in hand in 1869-70, and the present year, amounting to Rs. 18,783, against the year, renders them still unsatisfactory. This arises chiefly from the following causes.

1*st.*—Increase of expenditure on account of establishment without any increase of remunerative works, which have to be carefully considered, and which officers new to divisions and kind of work cannot be entrusted with, particularly in these provinces, where almost all accessible and remunerative timber has disappeared, and to remove that which now remains is very costly.

2*ndly.*—A large quantity of timber has been struck off stock in hand, owing to losses the value of which, estimated at former years' rates, amounts to Rs. 11,309-12. The causes of the losses are explained in Section IV.

3*rdly.*—Besides this, the amounts realized by sale have been at much lower rates than those estimated for the timber, owing to the timber latterly brought in having been found to be very inferior to that formerly sold.

133. This is the result in great measure of overwork at the commencement of the operations in Sikkim, which have already been commented on. The work was too extended to be properly supervised, and the Assistant Conservator, then newly appointed, committed the error (common to all who have had no experience) of cutting timber without considering cost of removal, believing he had done a great work when the timber was felled, whereas it had better have remained standing in the forests. Operations in Sikkim were checked in 1868-69, and as shown at paragraph 27 of last year's report, no timber was felled during the year, operations being confined, as they have since been, to removal of timber previously felled.

134. A large portion of the sleepers, which have latterly been carted in from the forest depôts where they were lying, were found to be very inferior, and had to be sold at greatly reduced rates, rather than let them lie at depôts where they must deteriorate in value every month.

Many of the logs, too, brought in and sold were not such as should have been felled, and they had to be disposed of at very low rates. (*Vide* statement No. 26.)

135. Referring to remarks made in Section IV, regarding two seasons having passed without verification of the stocks said to be lying at forest depôts, it must be recorded here, though with very great regret, that it has been found, on bringing down timber reported as being at forest depôts (that is intermediate depôts where timber can lie in safety, and from which it can be easily taken to station depôts for sale), that the timber was still lying on the spots where it was felled. This would have been discovered long ago had the Assistant Conservator, who has since resigned, taken care at once to visit all localities where stocks of timber were said to be lying, as he had been instructed to do during the cold season of 1868-69. The forester who had charge of most of the work under Mr. Mann has been ordered down from Assam, and the matter will undergo investigation, as charges were made for removal of timber which, it now appears, was not removed.

Results of the Year.

136. The results of departmental operations during the past year are—

	Rs.	As.	P.
Collections by officers of the department	61,143	6	6
Forest produce collections by civil officers	58,534	2	5
Total ..	1,19,677	8	11

Deduct.

	Rs.	As.	P.			
Charges of the department	84,359	9	10			
Difference between assets and liabilities	13,820	5	0	98,179	14	10
Showing a total profit on the year's operations of				21,497	10	1

Full Collections not entered by Civil Officers.

137. As regards the collections made by civil officers, it would appear from the statements received, both from the Accountant-General and the Board of Revenue, which do not agree, that the civil officers have omitted several items of receipts, which in previous years have amounted to between twenty and thirty thousand rupees more than are shown this year. The Accountant-General's statement this year shows Rs. 58,534, as compared with Rs. 73,552 in 1869-70, and Rs. 53,362 in 1868-69. The amount therefore is subject to correction so soon as replies have been received to inquiries which have been instituted.

138. It is advisable, as has been remarked in Section VI, paragraph 156, that copies of the forest revenue statements prepared by civil officers should be sent direct to the Central Forest Office for scrutiny. If this were done, the revenue could be closely watched by the Conservator, and future discrepancies might be avoided.

SECTION VI—GENERAL.

Forest Rules for Lower Provinces.

139. Rules for the management of the forests in the Lower Provinces, sanctioned by the Government of India in notification dated 16th February 1871, were published in the *Calcutta Gazette* of 1st March 1871, and became law.

140. They have not yet, under rule 1, been extended to any of the divisions; but all Government forests already notified as such are under their provisions (*vide* rule 2) and subject to the authority of the Conservator.

141. These rules are the first under Act VII of 1865, which clearly recognize two distinct classes of forests, namely Open and Reserved forests. This point was not secured until after considerable discussion, but is very necessary to meet the present state of the forests in the provinces, as also the requirements of the many different tribes—some of them wild tribes—who inhabit many of the forest tracts. This division of Government forests into Open and Reserved forests enables us to set apart, for partial protection, large tracts which have originally been covered with heavy forests, but have been denuded in great measure of their timber by cultivators and timber cutters, and will recover themselves if the felling of saplings is prohibited. They are such as are best situated for the extraction of timber, as evidenced by their being first cleared, and are within reasonable distance of markets. Within these tracts the Forest Department has, under rule 13, authority only so far as the protection of Reserved trees is concerned, but can from time to time, after

selection has been made, declare any portions Reserved Forests. To have recognized only Reserved Forests under the rules would have rendered any protection over still existing forests impossible for a very long time, as survey and demarcation under part II would have been a work of many years, and would have put Government to a very heavy expense for boundary marks, which will only now be necessary in comparatively few cases. A copy of the rules is attached as Appendix to this report.

142. The establishment was increased during the past year by the addition of four Assistant Conservators to take charge of the so-called Bhaugulpore division, also Chittagong, Lower Assam, and Dacca divisions, and sanction was given to an establishment of all kinds up to Rs. 3,420 per mensem in Financial resolution No. 2014, dated 8th July 1870.

143. The distribution of establishment under this sanction has since been approved by the Government of India, *vide* No. 290F, dated 2nd May 1871, and takes effect from 1st June 1871, time being thereby given to effect transfers and give reasonable notice to those persons whose services have to be dispensed with under the new distribution.

144. It will be observed that there are no Deputy Conservators on the staff. When first the Conservator joined the Lower Provinces, little or nothing was known of the forests. The very existence of any, except in Assam and Bhútan, with protection, was uncertain; and it was deemed advisable, while mere exploring was going on, not to put Government to large expenditure on account of establishment. Thus it has happened that no Deputy Conservators were appointed. This economy was perhaps a mistake, though seeing the indifferent progress that it has been possible to make up to this time owing to many impediments, not at once surmountable, a mistake need scarcely be admitted; but the time has now come when an exchange of young Assistants must be made for Deputies of real experience to take charge of Assam and Cooch Behar, for instance, and manage all local details without direct orders in every instance from the Conservator, who cannot remain long enough in any one division to become sufficiently acquainted with all local detail to enable him to develop the full resources of the forests, and suggest every detail as to the best way of collecting revenue or working out timber. Efficient lieutenants are necessary, and will now be obtained.

145. Statement marked B gives the distribution of establishment in the several divisions hereafter detailed, as also the length and breadth of the charge, together with the area of forests in each, so far as it is at present possible to state it.

146. It will perhaps be useful here to give a comprehensive sketch of the present position of the Forest Department in the Lower Provinces of Bengal, together with remarks which may give some idea on the general question of forest conservancy in these provinces.

FOREST DIVISIONS.

147. The forest divisions are at present five in number:—

1.—The Assam division, containing the sub-divisions of Upper and Lower Assam.

2.—The Cooch Behar division, containing two sub-divisions, Sikkim and Bhútan.

3.—The Chittagong division.

4.—The Bhaugulpore division, which includes forests in the Patna and Chota Nagpore divisions.

5.—The Dacca division.

General Sketch of Present Position of Department.

148. The present position of matters in each of these charges is as follows:—

In Assam a general inspection of the forests has been made, and certain tracts have been selected for notification as Government forests. The boundaries of the tracts, however, have not as yet been sufficiently defined to enable the Commissioner of the division, to whom a general proposition was submitted, to approve them, and the Deputy Commissioners of districts have now been applied to to assist in further defining the tracts with a view to their being notified in the *Gazette*. The revenue survey maps of the country not being complete, and those which show the forests being unfortunately the last to be published, it has been impossible accurately to define the forest tracts by description supported by maps, and delay is therefore caused. The boundaries now being prepared will, it is hoped, satisfy the Commissioner.

149. Up to the present time, therefore, with the exception of the Nambur forests made over to the Forest Department by the Commissioner in January 1869, this department have no authority, under the forest rules, in any forests in Assam. The boundaries of the Nambur forests have not yet been defined, as no survey has yet been made.

Extract from a letter from the Officiating Commissioner of Revenue, to the address of the Secretary to the Board of Revenue,—(No. 182, dated 16th March 1863.)

In the other three districts, Nowgong, Durrung and Luckimpore, instructions have been issued to the Deputy Commissioners to call upon the fiscal officers in charge of mouzahs where valuable timber is known to grow in any abundance, to bind themselves to protect the forest from spoliation, and to allow no full-sized trees yielding valuable wood to be felled without payment of the following rates, and no young trees of the kind referred to to be cut at all.

	Rs.	As.	P.
Trees called tila sopa and all that are fit for boat-making, length from 16 to 18 yards, at	4	0	0
Ditto ditto, from 12 to 14 yards	2	8	0
Trees that are fit for boats, not of the above description, from 13 to 16 yards ...	3	0	0
Ditto ditto, from 12 to 14 yards	1	8	0
Trees of hard wood, such as Nabar, Jack, &c., fit for large posts for house-building, from 4 to 5 feet in girth	2	0	0
Ditto ditto small, 3 feet	0	8	0
Trees that are fit for beams for houses (small)	0	2	0
Ditto ditto small (narrow) planks	1	0	0
Ditto ditto broad	1	8	0

Memo. No. 508.

Copy forwarded to the Deputy Commissioner of Durrung for information and guidance, who is solicited to act upon the orders above alluded to.

By order of the Commissioner of Revenue.

Revenue Commr's. Office; Assam, *The 20th March* 1863. — D. Bruce, *Head Assistant*

150. Revenue is collected on timber under order of the Commissioner of Revenue dated 20th March 1863, copy as per margin, and also on India rubber, stick lac, Soom forests (Machilus Odoratissimus), on which silk-worms feed, &c., by the Deputy Commissioners of the districts, and the amounts so collected are finally incorporated into the provincial accounts as forest revenue, but distinct from departmental operations.

151. Pending the notification of Government forests in the *Gazette*, timber operations were this year opened out on a small scale as a tentative measure on the Debroo, Dehing, and Dhunsiri rivers. These operations have already been detailed in Section IV.

152. The India rubber supplies from Assam might, from a yearly outturn of some 5,000 to 6,000 maunds (a large portion of which, however, is probably collected beyond the British frontier), valued at two to two and half lacs of rupees, be increased to almost any amount in the course of a few years, if liberal grants for improvement, and increase of the forest, were judiciously applied for the purpose. Proposals for the management and increase of the India rubber forest have been lately submitted to Government for orders, and are under consideration.

153. The silk industry, it is feared, is declining, owing to the introduction of cheaper European fabrics, which the natives are adopting, and against which, as regards price, the silk textures cannot compete. But a considerable revenue is still derived from these forests, which are let out for silk-worm feeding. In 1869-70 this amounted to Rs. 30,720 in Luckimpore and Seebsaugor. A short note on the subject of silk-worms will be found in Appendix C attached to this Report.

154. The trade in shell lac might be enlarged indefinitely.

155. All these sources of revenue, as well as the local timber trade, could be made to produce a very considerable revenue if carefully looked after and stimulated; but this cannot be done by the civil district officers, who at present collect this revenue. Their time is occupied early and late in other important matters. These sources of revenue require the care and attention of a special establishment all over the country, with a sufficient staff to control the receipts, a considerable portion of which, there is room to believe, sticks to the pockets of mouzadars and other collectors, who receive a percentage on the amounts collected, or is not collected at all, as is evidenced by the paltry revenue shown as receipts. The revenue alone on timber for the thousands of boats made every year would be considerable if the rivers down which they are brought were watched or commanded by toll stations.

156. The Forest Department has not up to the present time been in a position to take over charge of this revenue, and it is doubtful whether it would be advisable that it should, except in the case of collections on account of timber, as jealousies might arise which would lead to difficulties, and the discretion of local forest officers cannot always be depended on; but certainly the Forest Department ought to have the returns of all such collections in detail under distinct heads sent to the Accounts Office monthly or quarterly, so that a close watch may be kept over them, and causes of decrease looked into, while means of improving receipts may be considered. These miscellaneous receipts are the backbone of the forest revenue in the country, and would form a very important item of revenue if properly attended to. How far the Forest Department should interfere in collecting it, it will be for Government to decide hereafter; but it certainly should not be considered as revenue apart from the Forest Department. At present the department takes no credit for anything but sums received on timber brought out by the department and sold by it. These operations have been very trifling up to the present time. All expenditure of an unproductive kind for protection of the forests, plantations, stock of kinds, &c., is debited to it. Under these circumstances, while almost all revenue the collection of which costs little or nothing is cut off from the credit of the department, it has all the expensive machinery attached to it placed at its debit. That a yearly deficit should be recorded is therefore no wonder, and the financial position of the department should not be judged of apart from all receipts derived from forests which, when added together, show a yearly surplus. A small increase of establishment would enable the Forest Department to collect all forest revenue apart from the civil officers; and as they cannot devote time to looking into the detail of the sources of such revenue, while doing so should be a special subject of attention by the forest officers whose work lies entirely in the districts, there is every reason to believe that departmental agency in this matter would result in a great increase of revenue, provided this agency tempered zeal with discretion, and maintained close communication with the district civil officers—a point insisted upon in all instructions given to forest officers, who are perhaps rather too much inclined to be too departmentally exclusive and independent.

Tea Cultivation in Assam.

157. Tea cultivation in Assam has yet to be mentioned.

This cultivation has a future in Assam, and all along the line of the North-Eastern Frontier as far as Nepal, which will probably, ere many years are passed, almost oust China tea from the Home markets. Tea is being grown over many parts of India; but here, by reason of climate, due to peculiar situation, it will probably be found that tea cultivation will chiefly flourish and be a success.

158. The following quotation* from a letter written by a thinking and able man, at present a tea planter in Upper Assam, is worth attention, and is therefore attached here.

* Appendix D.

Tea cultivation in Assam now yields nearly 70,000 maunds of tea per annum. That this produce will be doubled in the course of a very few years if encouraged, there can be little doubt; and as each maund of tea requires a cubic foot of timber to pack it in (*i.e.*, 1,400 tons of timber a year), each acre of tea requires 1½ maunds of charcoal to manufacture it, and an acre of ordinary forest produces only about 66 maunds of charcoal. Supposing the forest to reproduce itself fit for cutting in ten years for this purpose, as only small wood is used, something like 27 square miles of forest are perpetually required to furnish charcoal for the present manufacture of tea alone.

159. Here it may be remarked that a supervision of the scattered forests in the plains is necessary, though most people (as is generally the case with regard to forest questions,) think that the forests are so inexhaustible as to render any attention to them unnecessary. The Government of India, in paragraph 6 of their review of forest report for the year 1869-70, remark as follows:—

"The exhaustion of the forests near some of the great tea plantations is also noticed, as well as the fact that planting operations have been undertaken by the Assam Company to provide themselves with charcoal. It may be advisable not to interfere too much as regards petty details with the supply of timber for the general wants of the great tea companies in Assam, but the above remarks show the necessity of exercising due control over their operations in the forests. It is to the interests of the Companies themselves, as much as those of Government, that the supervision of the State over the working of the forests should be more than a nominal one; while for the benefits of this control the Companies must be prepared to pay, in the shape of a royalty, on the timber used by them."

160. These remarks are true. Suitable tracts for tea planting are not so extensive as is supposed. Tea planters require land with forest upon it, not only because forest-covered land, when cleared, is the richest, but because a proportion of forest is required near at hand for charcoal. This renders selection of such tracts as should be retained for tea planting necessary. In these tracts jooming should be checked gradually, but steadily, and at once. There will be plenty of other tracts available for these wretched cultivators. The subject of jooming has been remarked on in Section I.

161. The province of Assam extends over 30,000 square miles of country The richness and quickness of its vegetation is probably unsurpassed anywhere in the world. It contains mountains and plains capable of producing almost any variety of tropical produce; but its population is so scant and poor, that it must be long time before its riches can be developed.

162. The forests of the country are numerous, and contain very large stocks of mature timber. The rivers, which take their rise in the ranges of hills north and south of the Assam valley, and empty themselves into the Brahmapootra, afford every facility for bringing down timber in almost any quantity; but unfortunately the valuable timbers do not float, and thus there is great difficulty and expense attending the removal of the timber, the price of which is regulated by what it will fetch at Calcutta, where the market is kept well supplied by sea, from almost all parts of the world, at a reasonable rate. It is this which so greatly detracts from the value of all forests in the Lower Provinces. Still, however, it is believed that the immense stocks of timber in Assam could be profitably worked out if suitable measures were sanctioned. The use of steam machinery would be absolutely necessary, as also an experienced local forest establishment.

163. It is unnecessary here to go further into this subject. The whole matter is one which requires much more information than we at present possess. The result of the work now going on will go far to clear up the question of available labor, which is the most important point.

Cooch Behar Division.

164. In Sikkim the tracts of Government reserved lands and forests contain 44,800 acres, scattered over an area of about 700 square miles. These have been notified in the *Gazette*.

Bhutan.

In the Bhútan sub-division the areas set apart for Government forests cover an area of 448,000 acres, in a country extending over an area of about 30,000 square miles.

Timber operations have been carried on almost the whole length of the division—from Darjeeling, where heavy timber was felled in 1866 and 1868 for barrack building, to Buxar in the Western Dooars.

165. These general operations have been stopped, and it is proposed in future to confine them to one locality in each sub-division; but there is a large quantity of timber felled which has still to be brought to station depôts and sold. This is being steadily done, and it is hoped that Europeans acquainted with forest operations will eventually be prevailed on to purchase the timber as also to bring it out. Arrangements in that direction are now being made with reasonable hope of success.

166. The work to be done in this division is very heavy. Most of the forest reserve boundaries have to be properly demarcated in a permanent manner. They should be gone over every year to see that they are not intruded on. The tracts have yet to be departmentally surveyed and valued. Plantations should also be proceeded with.

167. The protection of the forests in this division is very difficult. The forest localities are perhaps the most pestilential to be found anywhere. They are many of them inaccessible during the rains except to timber thieves; and they are traversed in Bhútan by such a number of rivers running through the neighbouring state of Cooch Behar, down all of which timber can easily be taken and sold, that a large establishment is necessary to do the police work of the department. An insufficient and weak establishment here can only end in disappointment, and defeat the objects sought, *i.e.* protection of the forests. The mischief and depredation which can be carried on unobserved for years in forests which cannot be be inspected every year, yet from which produce can easily be taken down to market, may not be discovered for a long time. A native watcher will report everything going on well until a European going into the tracts discovers the mischief and robbery which has occurred. It would be better to abandon many tracts altogether, and confine protection to a few, well looked after, than pretend to protect numerous tracts with an inefficient establishment, which only brings all management into contempt.

168. Every river in Bhútan requires its watchers, and the assistance of local police to give information.

Timber operations in this division can be rendered profitable if European permit-holders, who understand the bringing out of timber and have ready sale for it, can be introduced into the forests; but unless this can be done it will be advisable to restrict operations to supplying local wants, deferring more extended operations until means of transport have improved, and local demands for making a railway render it advisable under the managment of a Deputy Conservator of experience to increase them.

169. In the meantime there is very much to do in bringing this division into proper order and in collecting the local revenue, which can be much improved by care and watching.

CHITTAGONG DIVISION.

170. In this division an area of 5,670 square miles has been set apart and notified as Government forests (*vide* notification dated 27th January 1871), and two tracts on the Kurnafoolee, containing 966 square miles, it is proposed to set apart as Reserves. Only a small portion of these areas has yet been inspected.

171. The forest revenue here is collected at river toll stations, which were taken charge of by the Forest Department on the 1st of April 1871. The revenue is received in cash before the produce is passed. Permits are given to the "Capitans" of gangs of wood-cutters, who go up to the forests to cut timber, and certain restrictions as to size of timber to be felled are entered on the permits.

Undersized timber will be confiscated at the toll station.

172. These "Capitans" pay a fee of Rs. 10 for registration of their hammer mark, and 8 annas a head for each coolie who accompanies him to go up and fell or purchase timber, before he has a permit given to him. As he goes up the rivers, he is compelled to report himself at the chief civil station on the way, and show his permit before he is allowed to proceed.

173. This system, it will be observed, can scarcely be called forest conservancy; but it was not deemed advisable at once to upset a system which had been going on for years, as the hill tribes require careful handling. This system has at least the advantage of rendering collection of revenue on forest produce easy, and the amounts now collected are considerable. Much of the timber brought down comes from immense distances above where it would be possible to carry on forest conservancy. Indeed, the tracts within what may be called the line of real British influence have in great measure been worked out wherever the timber was easy of access from the rivers. So far as present reports go, the increased rates of toll sanctioned by Government in letter No. 367, dated 27th January 1871, are being levied with less grumbling than might have been expected; but it has been necessary to employ the whole establishment sanctioned for the division to look after the collection of the revenue.

174. There is therefore no establishment yet in charge of the forests or proposed Reserves, and the only protection they are getting is the prohibition as respects the felling of undersized timber.

175. This in the first instance is perhaps as much as can be or ought to be done.

176. In the proposed reserved tracts above named, hill cultivation is not carried on; but in the other tracts it has not been deemed advisable to interfere at present with the tribes who inhabit them.

177. Felling of timber, when commenced, will be carried on under a conservancy system departmentally.

Perhaps the greatest real destruction that takes place in a forest is the felling of hundreds of young saplings for rollers, &c., to remove one tree. But such destruction is inevitable, if the work is done by coolie labor: hence the absolute necessity for the introduction of elephants, where practicable, for the extraction of timber. Wherever it is proposed to fell timber, an establishment of elephants should be ready to do the work.

Bhaugulpore Division.

178. As regards the Bhaugulpore division, there is at present only a small office establishment. This forest division, so far as Chota Nagpore is concerned, was inspected last year; and the Sarunda forest in Singbhoom, of which Government is the zemindar, promises large supplies of Sâl with good river carriage for transport of timber. Inquiry is now being made as to the routes by which timber can be brought, and markets for sale, together with cost of working and value in markets.

Dacca Division.

179. The Dacca division is known to contain vast forests containing much the same varieties of timber as are found in Assam. Revenue is at present collected under the civil officers at the Sealtekh river toll station. The district has not yet been visited by a forest officer, and it will probably be better to let the temper of the wild tribes all around calm down before any conservancy measures are taken.

Duties of a Forest Department.

180. From the foregoing it will perhaps be gathered that the duties which properly form part of the employment of a Forest Department should not be only felling of timber for sale from a few reserved forests or rivers, and the protection of certain forest tracts from destruction, supplemented by the making of a few acres of plantations every year.

181. Thus far forest conservancy has been treated from a departmental point of view; but there is another view which may with some reason be maintained, for the Lower Provinces of Bengal are peculiarly situated as regards supplies of timber.

General Remarks.

182. Calcutta and neighbouring markets are supplied by sea from all parts of the world, and the prices of timber are regulated by these markets.

183. Districts up-country are supplied for the present either from Calcutta or Nepal, as they contain no forests, and plantations cannot yield supplies from eighty to a hundred years; other divisions, such as Assam, Cooch Behar, Dacca, and Chittagong, contain forests enough to supply timber for all local purposes.

184. Under these circumstances it may be asked whether it is necessary to maintain a large forest establishment to watch over the forests. Could not the civil authorities collect all revenue on forest produce at little cost for extra establishment?

Might not revenue on timber in Assam and Cooch Behar, for instance, be collected at toll stations on rivers, like in Chittagong and Dacca, and only such forest officers be retained in the Lower Provinces as are required to carry on the plantations which Government may decide on establishing up-country? Such remarks may with some show of reason suggest themselves to many. This is not, however, the place to enter into a discussion on the subject. The whole question of forest conservancy in Lower Bengal will, it is hoped, shortly become subject of consideration by a competent committee, who will decide the position and duties of the Forest Department.

185. It has not been possible hitherto to propose the appointment of such a committee, as until lately sufficient information had not been gained to make it advisable to do so; but the time has now come when the Conservator is sensible that the views he may have formed should be subject of discussion by those who are authorized to decide upon the future operations of the Forest Department in Lower Bengal, and application will be made to Government for

the appointment of a committee of forest officers, of whom the Inspector-General will form the head, joined by Commissioners of divisions, which will be able to consider separately what course should be finally adopted in each division, a final report being submitted to the Government of Bengal for review.

Conservator's Tours.

186. The Conservator visited the following districts during the year:—Sikkim in May and June; Chittagong in August; Bhútan (Julpigoree), on the transfer of officers to different divisions, in October; Chota Nagpore (Palamow), in company with the Assistant Conservator, in December and January; Assam during March, April, May, and part of June, being detained there in charge of the Assistant Conservator's office, as Mr. Mann had gone home on sick leave, and a relieving officer did not come to Assam till late in June.

187. The establishment underwent several changes during the year. Messrs. James and Thomas, formerly in the police, joined the department in July 1870; Mr. Oakley resigned his appointment in January 1871; Mr. Mann went on sick leave to Europe in March; Captain Losack joined the department from Oudh in December 1870: the officers were therefore all new to their work and districts, which detracted from their efficiency during the past year, and renders it impossible for the Conservator at present to express any opinion as to their several merits. He would, however, record his thanks to Captain Losack for the zealous and cheerful manner in which he has at once shown himself to enter into the work he has been placed in charge of.

APPENDIX A.

FOREST RULES.

Rules for the better management and preservation of the Government Forests in the Lower Provinces of Bengal.

PART I.

PRELIMINARY.

THESE rules shall be in force in those tracts of land which may be declared to be Government forests under Act VII of 1865, and they shall regulate the transit of timber and other matters in those districts to which these rules may be extended by an order of the Government of Bengal published in the *Gazette.*

2. On any tract being declared by notification under section 2, Act VII of 1865, to be subject to the provisions of that Act, it shall be subject to the authority of the Conservator of Forests under the following rules Provided that the Government may appoint any person other than the Conservator of Bengal Forests to be Conservator of any specified tract.

3. Divisions and sections of Government forests will be placed under the management of Deputy and Assistant Conservators, as may be determined by the Government of Bengal.

4. All officers charged with the protection and management of any Government forests, or with the control and management of any matters to which these rules relate, will be designated forest officers.

5 The Government forests, as notified under section 2, Act VII of 1865, shall be marked on a copy of the revenue survey map of the district, which shall be deposited in the office of the Commissioner of the division, and attested by his signature.

6. There will be two classes of forests—Reserved and Open; and whenever any notification is issued under section 2 of Act VII of 1865, rendering any land subject to the provisions of that Act, such notification shall state whether such land is to be a reserved or an open forest.

PART II.

OF RESERVED FORESTS.

7. The reserved forests shall consist of tracts or forest of waste lands, the soil of which is the property, and is in the possession of Government, which may be set apart as such by order of Government, and defined by notification in the official *Gazette.* The Conservator of Forests and his subordinates shall have entire administration, custody, and control over these forests and their products.

8. Within reserved forests no tree of any kind is to be felled, nor shall any forest produce be removed without general or special authority obtained from the Conservator of Forests.

9. The boundaries of these forests must be clearly marked off by substantial marks where no natural boundaries exist. Should villages be included within these tracts, the boundaries around the village lands must be demarcated in the same manner as the forest, subject to the proviso in section 2, Act VII of 1865.

10. Whenever the Government may resolve to set apart any tract as a reserved forest, the privileges which villagers are to be allowed to enjoy, and any customary rights which may belong to them in the matter of providing themselves with firewood and wood for domestic and farming purposes and otherwise, shall be distinctly defined and approved by Government. It shall not be contempt to the Conservator in any way to restrict or modify privileges so allowed, except with the approval of Government.

11. As soon as the notification required by section 2 of the Government Forest Act, stating that the forest is to be a reserved forest, is published in the *Gazette*, a notification shall be published and issued to the villages around, mentioning the boundaries of the tract reserved, warning the villagers against trespass or mischief, and defining the restrictions imposed on them, and the privileges allowed to them, within the reserved forest under this section. This notification will be issued by the district officer, and a copy will be sent to

the forest officer for information. The Conservator will, nevertheless, be careful to give prompt attention and consideration to any complaints which may subsequently be preferred, to the effect that the restrictions so imposed infringe rights of, or inflict hardship upon, individuals or communities.

12. The Conservator of Forests may prohibit all persons from passing through a reserved forest, except by the authorized roads or paths, of which a list shall be published, drawn up by the Conservator in conjunction with the chief civil authority.

PART III.

Of Open Forests.

13. The open forests shall consist of such tracts of forest or waste land notified under section 2, Act VII of 1865, as may not by special notification be included in the reserved forests. In these tracts the authority of the Forest Department shall extend only to the protection of such reserved trees as may from time to time be notified with the approval of the local Government.

14. Within the limits of open forests, and subject to the proviso in section 2, Act VII of 1865, no person, without the permission of the forest officer, may mark, cut, girdle, or fell, or in any way injure any tree of the kinds which may be reserved as aforesaid.

15. Until the Government forests to which these rules shall be applicable in any district are settled and defined under section 2 of the Act, no lands in the district which are covered with trees, brushwood, or jungle, and after the forests shall have been defined, no such land in the open forests shall be sold, nor shall grants or leases in such lands be given, except under the orders of the Commissioner, who should, before passing final orders, communicate with the Forest Department; and in case of difference of opinion between him and that department, refer the question to the Government.

16. In addition to the reservation of the trees of the kinds which may be notified as reserved under rule 13, it shall be competent to the Conservator of Forests and his assistants to prohibit the felling, cutting, or otherwise using trees of other kinds which they may have marked or girdled within the open forests.

17. No other restrictions shall be imposed by the Forest Department in regard to the open forests, except after the publication of notifications with the approval of the Government.

18. Should the Conservator think it desirable to impose any further restrictions than those above specified in any open forest, he shall, in the first place, communicate his proposals to the Commissioner of the division, who shall give his opinion on the subject. Before approving of any such proposals, it will be the duty of the Commissioner of the division to satisfy himself that the proposed restrictions will infringe no rights or privileges which should be preserved, and to define precisely any privileges which should be kept intact. On receipt of the proposals as agreed upon between the Conservator and Commissioner, the Government will sanction the issue of notifications imposing such restrictions as it may see fit.

PART IV.

Of the Use of Streams, of Marking-Hammers, of Timber in Transit, and of Drift Timber.

19. A list of rivers, streams and waters in each district to which these rules may have been extended, which must be kept open for the passage of timber, will be made by the Forest Department in conjunction with the civil officers of the district, and be published for general information; and it will be the duty of the civil officers to see that these streams, rivers, or waters are kept open.

20. No timber, the produce of any Government forest, found adrift or stranded in any river, stream, or water of any district to which these rules may be extended, shall be marked until disposed of by the Forest Department; neither shall any mark on it be defaced. It shall not be converted or cut into pieces, neither shall it be removed or disposed of in any way without the orders of the forest officer, except on an order or decree by a competent court.

21. All timber disposed of by the Forest Department must be stamped by the Forest Department with such marks as the Conservator may direct.

22. All brands, or marking-hammers used in the marking of timber, must be registered in the principal Forest Office of the division in which they are to be used. A fee of Rs. 10 must be paid for every mark registered, and a certificate will be granted on payment of fee.

23. The use by any private person of any Government timber mark, or of any other timber brand or mark, save the one registered in his own name, is prohibited.

24. All foreign timber brought into British territory shall be reported and stopped at such stations as the Government of Bengal may from time to time direct, and such timber shall not be allowed to pass until it has been examined. The persons in charge will receive a pass in the form shown in schedule A, and the timber will be liable to detention, if found afterwards without a pass in any district to which these rules are extended.

25. All timber found adrift or stranded in the rivers, streams and waters of any district to which these rules may be extended, and which is the produce of any Government Forest, will be considered the property of Government, unless proof of ownership be given.

26. Persons who may have saved such drift timber are required to deliver the same to such persons as are authorized by the Conservator of Forests to receive it, on receipt of such salvage rates as may be approved by the Government of Bengal.

27. The forest officers shall take possession of any drift timber found in any river or stream, or lying in the bed of any river or stream within any district to which these rules may be extended, as to the ownership of which there may be any doubt; and the same shall be treated as drift timber under rules Nos. 28, 29, 30, 31, and 32 below.

28. All drift timber collected by forest officers shall be stored at such depôts as the Conservator of Forests may from time to time order to be established.

29. From time to time, as the collection of drift timber may render it advisable, public notice, inviting claimants to the ownership of such drift timber to come forward, will be issued at the chief stations of the district, and in the nearest town to the place or depôt at which such drift timber may be lying. These notices shall state the number and description of logs collected.

30. Six months' notice will be given for the reception by the forest officer, by whom the notice was issued, of claims to drift timber, after which, if not claimed, the timber will be sold on behalf of Government.

31. Claims to drift timber must be sent to the forest officer by whom the notice was issued, with particulars of marks by which it may be recognised. The said forest officer will inquire into the claim. If the claim be a single one, he may, on being satisfied of its validity, release the timber after expiration of the term mentioned in the notice. If the claim be a disputed one, he should endeavour to obtain the formal consent of the claimants to his arbitrating on their claims. Where the dispute cannot be so decided, and there exists any reasonable doubt as to the rightful owner, the forest officer will retain possession of the timber until the question of ownership be decided by the civil court having jurisdiction in the case: Provided that if no claim be preferred in such court with two months from the date on which the forest officer shall declare his inability to settle the dispute, the timber may be disposed of by the forest officer on account of Government.

32. Timber awarded to claimants must be redeemed by payment of the salvage rates approved by the Government of Bengal, and other expenses which may have been incurred on account of such timber.

PART V.

Of the Prevention of Offences and of Punishments.

33. It shall be the duty of all forest officers to see that these rules are not violated; and should they in any case be infringed, to arrest the offenders and convey them without delay to the nearest Magistrate or police officer in the division or sub-division in which the offence took place.

34. Any person infringing any of these rules shall be liable to be punished by fine not exceeding Rs. 500, or, in default of payment of such fine, by imprisonment for such term as is mentioned in the 6th section of the Indian Penal Code. But no fine shall be imposed in addition to the confiscation of any timber or other forest produce, or of implements, which may have been incurred under Act VII of 1865.

35. Any marking-hammers or other tools or implements, boats, carts, and cattle used in an act which constitutes an offence against these rules, and all timber that has been marked or obtained in a manner contrary to these rules, or that has not been reported and passed in

accordance with these rules, whether entire, or cut up, or sawn up, may be seized by an officer of the Forest Department, or police officer, and such tools or implements, boats, carts, cattle and timber may be confiscated by the orders of the Magistrate of the district.

Schedule A

Form of Pass for foreign timber imported into British territory.

Number.	Date	Owner or Consignee	Place of Destination	Description of Timber	Timber Marks	Number of Logs or Pieces	Total.

APPENDIX B.

Forest Department, Bengal.

Scale of Establishments, exclusive of Officers, in the different Forest Divisions of Lower Provinces, Bengal, as sanctioned by the Government of India in No. 290F, dated Simla, 2nd May 1871.

Description.	Amount of Salary.	Remarks.
Cooch Behar Division.	Rupees.	Area of division—
1 Writer	70	12,169 square miles.
1 Office peon	6	
Forest Conservancy Establishment.		Area of Government forests—
1 Forest ranger, 2nd class	50	Sikkim 70 (Reserved) square miles.
2 Foresters, 1st class, at Rs. 20 each ..	40	Bhútan 700 square miles proposed.
2 „ 2nd „ at „ 14 „ ..	28	Total 770 „ „
11 Watchers, at Rs. 7 each	77	
Total ..	271	
Chittagong Division.		Area of division—
1 Writer	70	14,428 square miles.
1 Office peon	6	
Depôt Establishment.		Area of Government forests—
Kurnafoolee { 1 Forester	25	Open .. 4,704 square miles.
Kurnafoolee { 4 Watchers, at Rs. 7 each..	28	Reserves.. 966 „ „
Sungoo .. { 1 Forester	15	Total .. 5,670 „ „
Sungoo .. { 2 Watchers, at Rs. 6 each..	12	
Matamoree { 1 Forester	15	
Matamoree { 2 Watchers, at Rs. 6 each..	12	
Baghkhalee { 1 Forester	15	
Baghkhalee { 2 Watchers, at Rs. 6 each..	12	
Haldah .. { 1 Forester	15	
Haldah .. { 2 Watchers, at Rs. 5 each..	10	
Fenny .. { 1 Forester	15	
Fenny .. { 2 Watchers, at Rs. 6 each..	12	
1 Mohurrir	16	
Total ..	278	

Description.	Amount of Salary.	Remarks.
Dacca Division.	Rupees.	Area of division—
1 Writer	60	28,524 square miles.
1 Office peon	6	Forests not explored, but very extensive.
Forest Conservancy Establishment.		
1 Forest ranger, 2nd class	50	
1 Forester, 2nd class	14	
5 Watchers, at Rs. 7 each	35	
Total ..	165	
Bhaugulpore Division.		Area of division—
1 Writer	60	Bhaugulpore.. 16,917 square miles.
1 Office peon	6	Patna .. 24,387 „ „
1 Forest ranger, 2nd class	50	Chota Nagpore 36,000 „ „
1 Forester, 2nd class	14	Total .. 77,304 „ „
6 Watchers, at Rs. 7 each	42	
Total ..	172	
Upper Assam Division.		Area of whole of Assam—
1 Writer	80	30,000 square miles.
1 Office peon	7	
Forest Conservancy Establishment.		Area of forest, about—
1 Forest ranger, 2nd class	50	4,000 square miles.
2 Foresters, 2nd class, at Rs. 14 each ..	28	
8 Watchers, at Rs. 7 each	56	
Total ..	221	
Lower Assam Division.		
1 Writer	60	
1 Office peon	6	
1 Forest ranger, 2nd class	50	
2 Foresters, 2nd class, at Rs. 14 each ..	28	
7 Watchers, at Rs. 7 each	49	
Total ..	193	

APPENDIX C.

NOTE ON SILK MANUFACTURE IN ASSAM.

THERE are several kinds of indigenous silkworms in the province. Mr. T. Hugon, in a report submitted by Colonel Jenkins, a former commissioner of Assam, to the Agricultural Society, mentions the following:—The *eria*, *mooga*, *kontkuri*, *deo-mooga*, and the *hanu potonee*, besides the mulberry worm which is supposed to have been introduced by the Hindoos, who kept the silk of these worms for the use of their rajahs and great men. The Assamese will not make the silk from the mulberry worms, as touching them is considered degradation. A tribe called the Joogees alone attend to these worms.

The *deo-mooga* is said to have been introduced into Burmah by the Assamese taken into captivity after the conquest of Assam by the Burmese.

The kinds of silk mostly made and in use are—1, the *mezankoory;* 2, the *pât;* 3, the *mooga;* and 4, the *eria.*

The value of these kinds is at present given at the following rates per seer, viz.—*mezankoory*, Rs. 20 to 25; *pât*, Rs. 20; *mooga*, Rs. 3 to 8; *eria*, Rs. 2.

Mr. Hugon has mentioned the rates for *mooga*, in 1837, as having risen rapidly in three years from Rs. 3-8 to Rs. 5, and that it then sold at Gowalparra at Rs. 6-8 to Rs. 7, and at Dacca and Moorshedabad at Rs. 8. Nothing is mentioned regarding the price of the better kinds of silk; but it would appear from reports since written that the present value of the better kinds of silk has nearly doubled within the last few years.

Sufficiently precise information has not yet been obtained regarding the quantity of silk now made in Assam to justify any conclusion being come to as to the cause of this rise of price.

It was estimated in 1836 that about 1,000 maunds of silk were made in Assam, and that of this quantity some 300 maunds (representing a value, at Rs. 5 per seer, of Rs. 60,000) left the province, mostly for sale at Berhampore. Information as to present probable export has not yet been obtained, and it is not easy to get clear information on the subject. The civil officers of the district, who have now been called upon to report on the subject of silk manufacture, will no doubt be able to give valuable information for future guidance, which it is not possible at present to give here.

The shrubs and trees upon which the silkworms feed are very numerous. A list gathered from various sources is given below.

It would appear that the silk from worms fed on the *soom* tree (*Ricinus communis*) is the best, but it is said that the leaves of this tree are too hard for very young worms, which may be fed with advantage on the leaves of the *champa* until old enough freely to eat the *soom.*

Both these trees, as also the *addakoory* and others on which the silkworms feed, are found in tracts from which original forests have been cleared for cultivation.

The *soom* grows fast and attains a large size; but for silkworm-feeding young trees are used, as on them the worms are more easily managed, and the young leaves are in greater proportion. The *soom* is said to renew its leaves three times during the year. The patches of *soom* forest are scattered over the country, and cover an area generally of about half to three-fourths of an acre each. Their aggregate area at the present time is unknown, but it would seem that it is greater than is required for the present feeding of silkworms. Such tracts as are applied for to the civil authorities, are let at the rate of about Rs. 2 an acre for one year; and the revenue derived from the forests from this source alone is very considerable. It amounted to upwards of Rs. 24,000 in the district of Seebsaugor during the year 1868-69.

It is apparent, from the slight sketch given of the subject here, that there is a great deal of local and precise information yet to be obtained before a decision is come to as to what steps should be taken to stimulate the manufacture of silk. It is probable that the introduction of cheap cotton goods among the people has in great measure weaned them from the use of silk for their own use, and diverted their minds from its manufacture.

The tax levied on the feeding grounds may have something to do with checking increase, as also the difficulty of obtaining sufficient cocoons to breed from. It would seem that the chief market for purchase of these is at Gowhatty, in the Kamroop district, where no silk is made, but where the people resort for the purchase of cocoons, which are taken up-country in baskets, by boat or road, to be used in Upper Assam.

Inquiry into the subject will no doubt show that several means may jointly be adopted calculated to increase and stimulate silk manufacture in Assam. Inquiries of this kind, however, require time and much detailed local information, which can only be obtained by continued residence in the country.

It may be interesting here to give an extract from Mr. Hugon's report, showing the mode of rearing the silkworms and methods employed for their protection. The process described refers to the *eria* and *mooga* worms, but will answer for all the kinds under slight modifications, with the exception of the imported mulberry worm, which is fed and reared entirely in the house.

Extract from Mr. Hugon's report.

To breed from, the Assamese select cocoons from those which have been begun in the largest number on the same day, generally the second or third day after cocoons have begun to be formed; those that contain males being distinguished by a more pointed end. These cocoons are put in a closed basket and hung up in the house, out of reach of rats and insects. When the moths come forth, they are allowed to move about in the baskets for twenty-four hours, after which the females (known only by the larger body) are tied to long reeds or canes, twenty or twenty-five to each, and these are hung up in the house. The eggs that have been laid the first three days, amounting to about two hundred, are alone kept; they are tied in a piece of cloth and suspended to the roof until a few begin to hatch. These eggs are white and the size of turnip seed. When a few of the worms are hatched, the cloths are put on small bamboo platters hung up in the house, in which they are fed with tender leaves. After the second moulting they are removed to bunches of leaves suspended above the ground; under them, upon the ground, a mat is laid to receive them when they fall; when they have ceased feeding they are thrown into baskets full of dry leaves, amongst which they form their cocoons, two or three being often found joined together.

* * * * * * * *

In four days the cocoons are complete. After the selection for the next breed is made, they are exposed to the sun for two or three days to destroy the vitality of the chrysalis. The hill tribes settled in the plains are very fond of eating the chrysalis; they perforate the cocoons the third day to get them; they do the same with the *mooga*, and sell few cocoons imperforated.

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The cocoons are put over a slow fire in a solution of potash, when the silk comes easily off; they are taken out and the water slightly pressed out; they are then taken one by one, loosened at one end, and the cocoon put over the thumb of the left hand, with the right they draw it out nearly the thickness of twine, reducing any inequality by rubbing it between the index and thumb: in this way new cocoons are joined on. The thread is allowed to accumulate in heaps of a quarter of a seer; it is afterwards exposed to the sun or near the fire to dry; it is then made into skeins with two sticks tied at one end and opening like a pair of compasses; it is then ready to be wove unless it has to be dyed.

The dyes used are lac, munjeet, and indigo.

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There are generally five breeds of *mooga* worms in the year; they are named after the months at which they generally occur:—

1. Jarooa, in January and February.
2. Jeytooa, in May and June.
3. Aharooa, in June and July.
4. Bhodia, in August and September.
5. Khotia, in October and November.

The worms thrive best in dry weather, but a very hot sunny day proves fatal to many at the time of moulting. At these periods rain is very favorable; thunder-storms do not injure them as they do the mulberry worm; continual heavy rains (which are rarer in Assam than in Bengal) are hurtful by throwing them down; showers, however heavy, cause no great damage, they taking shelter under the leaves with perfect safety. The worms during their moultings remain on the branches, but when about beginning to spin they come down the trunk, the plantain leaves preventing their going further down; they are collected in baskets, which are afterwards put under bunches of dry leaves suspended from the roof; they crawl up into these and form their cocoons, as with the *eria* several are often joined together; the silk of these they spin instead of winding; above the plantain leaf a roll of grass is tied for those that come down during the night to begin spinning in: after four days the selection of cocoons for the next breed is made, and the rest wound off.

The total duration of a breed varies from sixty to seventy days. The period is thus divided :—

Four moultings with one day's illness attending each	20 days.
From fourth moulting to beginning of cocoon	10 „
In the cocoon	20 „
As a moth	6 „
Hatching of the eggs	10 „
Total ...	66 „

The exact quantity of silk which an acre of *mooga* trees can produce could not be ascertained without a trial. Fifty thousand cocoons per acre, which makes upwards of 12 seers, are considered by the Assamese a good yearly return. Sixty rupees the value of 12 seers must be a very profitable one, for there is little labor or expense to the ryot in making or keeping up a plantation; whilst the trees are young, the ground is available for cultivation besides rearing worms; sugar-cane, rice, pulse, &c., are cultivated with benefit rather than injury to the young trees. The tax is 14 annas the acre in this district. The great value of the *mooga* is that it enables the weaker members of a family to contribute as much as the most robust to the welfare of the whole. Besides attending to the worms, most of them weave, spin, or make baskets while watching them.

List of the cloths made in Assam of mooga and eria silks.

Name of Cloth	Size in cubits.	Weight. Seer	Weight. Chittack.	Price of thread.	Cost of weaving.	Total.	Remarks
Mooga				Rs. As. P.	Rs. As P	Rs. As P.	
Soorias	7 by 1¼	..	6	1 14 0	0 3 0	2 1 0	Dhoties.
Ditto	16 by 2	1		5 0 0	0 8 0	5 8 0	
Mekla	5 by 1¾	..	4	1 4 0	0 2 0	1 6 0	Petticoats.
Rhia	12 by 1½	...	8	2 8 0	0 4 0	2 12 0	Scarfs.
Gaursha	8 by 1	...	2	0 10 0	0 1 0	0 11 0	Worn as turbans or round the waist
Goonta Bor Cappor	12 by 2½	1	.	2 0 0	0 6 0	2 6 0	Made of the floss and worn in winter.
Eria							
Bor Cappor	16 by 3	1	8	3 0 0	0 8 0	3 8 0	Worn in winter, and used as a blanket, also made into coats
Meklas	5 by 2		6	0 12 0	0 2 0	0 14 0	Used only by the poorer class
Rhia	10 by 1½		8	1 0 0	0 2 0	1 2 0	
Gaursha ..	8 by ½		4	0 8 0	0 2 0	0 10 0	

List of shrubs and trees fed on by silkworms.

Local names.	Botanical names
By Eria Worms	
1. Kossool	
2 Meekordal	
3. Hindoo Goch.	
4 Okonnee.	
5. Gomarree	Gmelina arborea.
6. Litta Pakoree.	
7. Borzonolly.	
By Mooga Worms.	
1. Addakoory.	Michelia sp.
2. Champa.	Michilus odorotissimus.
3. Soom	Cylicodaphne nitida.
4 Kentooloa.	Letrenthera diglottica.
5. Diglutee.	Laurus obtusifolia
6. Pattee Shoonda.	Tetrenthora machrophylla.
7. Sonhalloo.	Zizyphus jujuba.
8. Ber.	Bombax hepta phillum.
9 ?	Jatropha curcas.
10. Castor-oil plant.	

Appendix D.

In 1283 tea was first heard of as indigenous in Assam; in 1824 leaves, seeds, and some hundred plants were sent to the Botanical Gardens, Calcutta. For some reason or other Dr. Wallich (I believe) pronounced them not to be "tea," and maintained this for some six or seven years.

In 1832 Lord Bentinck deputed Captain Jenkins to examine and report on this question, and aided by Lieutenant Charleton he settled it as true that tea was indigenous. Two years later, 1834, Government determined to introduce to this province the China variety of plants, which we may now deplore, as it bids fair to exterminate eventually the fine indigenous kind. In 1836 China plants arrived.

In the above we may notice that it took years of discussion ere it was conceded we had tea here at *all;* and that after all, the most inferior kind was largely introduced and propagated.

During the discussions that followed, as to the most suitable localities, it was constantly asserted that an elevation sufficient to ensure *frost* in winter was a necessary condition of success, and so deeply was this ingrained, that it lasts to our day. Hill land was sought for everywhere. Teelas planted where cultivation was out of the question, or the entire surface soil would wash off, and where difficulties of transport were at a maximum; all this too when it is patent that flat or slightly rolling land can be far better worked and cultivated, and now seen to pay equally well or better.

Tea may perhaps be traced to Kumaon from the fact that one of the Tea Commissioners was Dr. McClell and, resident surgeon at that place.

Questions of soil and climate generally were attended to; but one branch of the latter subject almost entirely omitted, and which, except among planters, is even now almost ignored, *i.e.* the amount and *steadiness* of rainfall.

No matter how we may plant, prune, or cultivate, if we do not get rain the crop will fail. 1869 gave us some cases of this, and the spring of 1870 is a fresh case in point, where serious results followed the drought.

To most of us in Assam, this was an unusual affair, though not so to others. In the North-West and other places, where rain falls late, and more sparingly, the number of "flushes" of leaf are known to be far fewer than here, varying from 6 to 10 or 12 in some parts, and from 5 to 15 about Darjeeling even, while in Assam it is 20 to 22, which is most noteworthy.

We here get three flushes per month, while at Darjeeling and in the North-West they get often but one—see *Agricultural Gazette of India*, September 15th, 1870, &c.

Tracing the matter back, we find that at first there were said to be only four pluckings (or flushes) per season: the first in April, making Pekoe; second in June, making a coarser kind; third in August, making Souchong; and fourth in October, made Congou.

As time went on, the trees were pressed harder and yielded oftener, in some places now yielding eight pluckings, and where climate is most suitable up to twenty with profit.

It must be borne in mind that the *total* annual fall of rain will not indicate the most suitable area for tea growing. Many parts of India have a heavy annual fall down in a few months, and with long droughts before and after. What is needed is a steady monthly fall from, say, March till October, and it will be seen from *Sir Charles Lyell's Principles of Geology, Dr. Hooker's Himalayan Journal*, &c., that Eastern Bengal peculiarly fulfil these conditions.

The south-west monsoon passing over the Indian ocean and the Bay of Bengal becomes heated and charged to saturation with water, which it retains while traversing the lower tracts of land, until on the west side it impinges on Rajmehal, and on the eastern flank against the Khasi and Garo Hills, where, being deflected upwards into a colder strata, it precipitates water copiously.

Where no hills occur, as on the Calcutta line, this water-charged wind goes on till reaching Sikkim, where, meeting an obstacle and rising, it is cooled and discharges rain so freely that it makes Sikkim the "*wettest* part of the Himalayas."

It may be borne in mind that rainfall can be in excess, as at Cherra Poonjee, where the entire surface soil is so generally denuded.

In no other parts of the Peninsula of India can these conditions of steady average monthly rainfalls be found combined with suitable temperature and soil, and this leads me to consider Assam, Cachar, and lower ranges of Sikkim as really the only portions of this country *peculiarly* suited for "tea," as a staple.

In the North-West, in Bengal, and other places, tea will grow; but that it can be carried on *profitably* I very much doubt.

A collateral branch of this subject is the question of how far "forest" affects rainfall. Dr. Hooker says that the relative effects of rainfall on forest, and this again in return on the rainfall, are difficult to separate, as they act reciprocally, and undoubtedly *part* of our very "moist climate" is due to this cause; and how far it might be affected by extensive clearings is impossible to say with certainty.

It is usually regretted that with such fine soil and climate, Assam is such a huge "jungle," and that it is not opened up and cultivated extensively, while all the time it is possible that this *apparently* desirable object, if attained, might cause the ruin of the province for more than one reason; and that as these jungles disappear so may, to a great extent, the "fine growing climate," leaving us like lower Bengal.

This is a point on which all are more or less interested—Government, planters, and ryots. Last spring the latter suffered severely in many parts by the drought, as the land was too hard to plough till late in season. If it is once seen generally that North-East Bengal is *par excellence* the future "tea province," there will be as great a rush for land as of old for these forests, necessitating perhaps other *new rules*, unless the Government are prepared with sound arguments, demanding forest conservancy over and above those used by the Forest Department on account of timber. Grass land is here in abundance (fit to grow rice), there are many thousand acres of uncultivated "potar," as it is called; the native population could easily be quadrupled, adding to the prosperity of the valley, and grass jungle has little or no influence on rainfall.

There are reasons why the hills surrounding us need as yet no particular attention as to restriction in clearing forest, for as long as they are inhabited by the present races, "jooming" will be more or less a *necessity*, and thus some 90 per cent. of their area will be tree jungle. It is the attempt to render the plain of Assam a "fine open country" we must attend to. With regard to forest conservancy (as a principle), Assam is a most promising tract. It is especially suited for India rubber, of which there are several kinds (11 or 12 "bors" and some 40 ficus), Teak, Sâl, Sissoo, and many kinds of timber not yet known, and the preservation and propagation of which alone, to the exclusion of the host of useless timbers now on the list, would seem the soundest policy.

Large tracts on the banks of the tributary rivers, as near the hills as possible, could be reserved and laid out in forests. Of the various timbers worth growing, as yet little has been done of necessity. The forests generally, however, seem greatly overrated as to value of the standing timbers, and the attention of the department might profitably be directed more to the future than the present; and at same time that large future supplies of timber are secured, a general denudation be avoided. I may here remark that the really *workable* tea area in the province is far smaller than is generally supposed. To a casual traveller extensive tracts may be shown as tea land both in the plain and on the hills around, while to one in search for land it often turns out very limited. Patches of forest may be seen which on close scrutiny will yield but one or two per cent. of land safely above flooding level. In the hills, thousands of acres can be seen, out of a tenth of which alone could a "crop" be *transported*, and if steep, *cultivation* is impossible anywhere.

As regards irrigation, to which some writers point for the cure of drought, it is doubtful, first, if it can be done; secondly, if done, whether it would be effectual. A writer in the *Englishman*, October 12th, 1870, says—"Four or five men could irrigate eight acres per day." Let us compare this with ordinary rainfall. We here get about 25 of an inch per day, which on a garden of 200 acres equal some 5,000 tons of water. I doubt very much our ability either to lay this amount on or in teela gardens to find it *at all* during droughts; yet if all this could be laid on while the air passing over the garden was hot and dry, not a quarter would remain, but be evaporated in an hour. A *warm moist* air is what we need to force on the young shoots into leaves quickly (see *Lindley*), the air to be near the point of saturation so as to check evaporation, while the heat forces the growth, so that I doubt the advantage of irrigation with a dry air and hot sun shining, as is usual in droughts.

In conclusion, looking at the steadily increasing demand for Indian teas, the likelihood of recurring disturbances in China, and that tea when carefully grown (at the right localities) will yield large profits, it is no wonder we see the attempts made to introduce it as a staple all over India; but when carefully investigated, I believe it will be found that England's future tea garden will be Assam, and that wherever the climate is not both warm *and moist* from early spring to late autumn, tea, though it may grow, cannot be made to do so *profitably*.

APPENDIX E.

NOTE ON WORKING GOVERNMENT FORESTS.

PERMIT-HOLDERS *versus* GOVERNMENT AGENCY.

AT paragraph 9 of review of the annual forest report of the Lower Provinces of Bengal for 1869-70 the Government of India remark as follows:—

"But great care must be taken that if permits are issued, they are granted for short periods only to responsible parties, and that no prescriptive rights in working the forests are allowed to spring up, while due control is exercised by the forest department over the trees that are felled; and again (paragraph 30), it is a cardinal rule for forest management everywhere, that the actual felling of the trees should rest with the parties who have control of the forests, and it would appear on general principles desirable that no trees should be felled except by the direct agency of the forest department, after which they might be sold to contractors," &c.

2. His Grace the Duke of Argyll, Her Majesty's Secretary of State for India, in a review of the same report, remarks at paragraph 8 as regards the observations of the Government of India.—

"Mr. Leeds is strongly in favor of the permit system; and it has the advantage, with a small executive staff, of requiring less superintendence: but he passes over the consideration that the permit-holder may be a man of substance and may employ a large number of men, and that his object is present gain, while the object of the Government is the conservation of the timber for the future as well as for present use; with him therefore, as with other private individuals whom it is necessary to employ, a check is necessary; and the rule laid down by you, that no trees should be felled except by the direct agency of the forest department, ought to be adhered to."

3. The Government of Bengal, with reference to the order of the Secretary of State as given above, having requested an expression of my views on this subject, the following remarks are submitted, as an appendix to the annual report for 1870-71.

4. There is no doubt that the abstract rule as given by the Government of India, "that the felling of trees in a forest should rest with the parties who have control of the forests," is theoretically correct; but carrying it out, except under modifications to suit all the varying circumstances and requirements of time and place, is so far practically impossible, that if it were to be rigidly acted upon, in many places the resources of forests would remain untouched and perish where they grow, or timber would be felled which would never be removed.

5. As regards destruction done to forests under work in most parts of India, (park-like, pure, circumscribed forests, such as are met with in Oude, being excepted,) this is pretty much the same whether a Government agency or a permit system be employed. Timber cannot be extracted from the vast and scattered forests in India, which contain timber of all ages and kinds, without injuring some saplings of valuable kinds; and the coolies employed under contractors by Government agency, *i.e.* by the forest department, to extract timber, do as much injury as those of a permit-holder. Precautions are taken by means of penalty clauses in contracts as well as agreements with permit-holders to reduce this injury to a minimum, and on the whole it may, I think, be said that not much injury of a serious kind takes place.

6. The real question of preservation and supplies in natural forests lies in the measures taken to prevent the felling of under-sized and growing timber.

There are other little matters connected with the subject, but they need not be mentioned here.

7. I would remark that I am under the impression that future supplies, *i.e.* for a century hence, should be provided for by an extensive system of plantations of the best and most useful kinds of woods, so situated that the cost of removing timber will be small as compared with that from distant and almost inaccessible forests scattered over enormous tracts of country, and from which the supplies would be regular; while a general protection of the remaining forests in the country should be maintained, not only to economize resources while plantation timber is growing for local use, but in order to secure a certain area of forest covered land in the country, without which, as has been proved in many parts of Europe, certain unfavorable results occur.

To attempt a minute protection of the forests we possess here, for instance, would be to attempt that which could only be done at an enormous cost, if it at all, and render any profitable working of the forests impossible. Under permit-holders, if they can be got, the stocks of timber which have been growing for ages may possibly be got out with some profit to those concerned, but not in any other way I fear.

8. When a forest is worked under Government agency, it is intended that the trees should be selected and marked, killed and felled by the forest department officers.

But the number of officers granted by Government for the purpose is far too few to enable them personally to superintend all this work, and thus selection of the trees, in great measure, devolves upon a native forester, or the contractor who is to work out the timber, and who in his turn delegates part of the work to a coolie mistry. It may here be asked, after the timber has been marked and felled, how is it to be disposed of. No one would buy it without inspecting it. This cannot easily be done in the forests where the timber is lying scattered about, so that felling will in most cases also compel dragging and removal to depôts by the forest department.

9 I need scarcely go into details to show that this practically has little advantage over selection made by a permit-holder's people; indeed, I believe the permit-holder who is under heavy penalties, which can be recovered from him, is more careful to choose only the trees he intends to fell and take away, than the Government employés are to select for Government.

10. Of course it will be remarked that this should not be allowed; but those who have toiled all day hunting for trees fit for marking and felling up and down steep and hot mountains and into ravines, know how impossible it is to do more than a portion of the work that ought to be done, and for which there is only a limited short season.

11. Even though this work had been entirely done under the eyes of a European officer, what security is there afterwards that this timber only will be felled? There is not, and there cannot be, a sufficient Government establishment to be present with all the working parties in a forest, unless operations are very limited, and the forests compact and pure. Government agency in this work, so far as protection goes, is little more than a name as distinct from permit agency.

12. The permit-holder is free to employ a more efficient staff for doing his work. So long as he brings out the mature timber only which is in the forests,* he will, as a rule, do no harm to the forests; and in him, a man of substance, working on his own resources, and with his own capital, the forest department have good security against breach of clauses of agreement. Inspection of the forests he works is more complete, so as to detect any breach of agreement, and when discovered he must pay, running the risk also of finding his permit cancelled; but in the case of a contractor who is generally needy, and works on advances, Government have no hold over him, and small power of fining him for breaches of contract. Government is in fact in the contractor's hands, whereas a permit-holder is in the hands of Government.

* He can be restricted as to quantity, if necessary.

Mistakes, or breaches of rules, committed by Government subordinates lie hidden, while those of a permit-holder are brought to light and noised abroad.

13. These remarks tend to show that the forests are not practically, in my opinion, one bit safer under Government agency than under a permit system; while the latter has many advantages, in that "advances" (that destroyer of all peace to those concerned in giving contracts in this country) are entirely avoided, and the timber extracted is sold and paid for without any risk of loss.

14. It may be that the price received is not always so high as that which might be obtained at a good market, but these can be assimilated to market prices; and generally, if all things be considered, it is an advantage to sell timber as near the forests as possible, and thus avoid outstanding advances for dragging, carting, floating, hauling, and also the loss of timber in transit, and save all possible account and office work.

15. Another point has to be considered, where markets, as in the Lower Provinces, are few and bad, owing to the supplies which come to Calcutta by sea. Were Government to work the timber in the distant parts of the forests (where only at present any timber remains) under direct Government agency, they would have no certainty about the sale of their timber. If taken to market and sold at an open auction, heavy loss would very possibly be the result; whereas if a class of permit-holders who know all the intricacies of the local timber markets and prices can be created and got to work, they for the most part will have already "placed" the timber they are to work out at a price which will ensure them a certain profit of a few annas per cubic foot.

16. This to Government is impossible, and how impossible is shown by this, that even in the matter of sleepers,—the demands for which are regular, and the expenditure on which is a matter of considerable importance to Government where there is a 5 per cent. guarantee,—although I have sold a very large quantity of sleepers at different times, I do not remember selling a single one direct to a railway company.

17. All conservators of forests are responsible for the protection of the forests in their charge; they are also responsible to Government for making the best terms they can for the sale of all forest produce.

They may (or they are unfit for the appointment they hold) be trusted, under certain generally recognized principles, to make the best arrangements in order to secure both the above objects; and as what may answer in Burmah may be impossible in the Punjab, what will suit Oude will not suit the Lower Provinces of Bengal, these officers cannot be fixed down to any particular kind of action without reducing their efficiency.

18. Take, for example, the forests in Upper Assam. These virgin forests must and do contain vast quantities of mature timber, and also much that is far past age for use, and which is only preventing the growth of young valuable timber; but their supplies will never be brought to market with profit by Government agency, though gradually, if the way be shown by Government, it may be possible hereafter to get private enterprise to work them.

For this reason, I hope that the Government orders on the subject of direct Government agency in the matter of felling all trees will be so far modified, that while the principle is maintained as a "cardinal rule," conservators will be allowed to use their discretion as to the means to be employed, and that every possible facility will be given to private individuals who may be disposed to work forests and set up saw machinery; care being taken in the agreement to provide for protection of the forests, and that no prescriptive rights are allowed to spring up.

H. LEEDS,
Conservator of Forests, L. P.

The 3rd August 1871.

Form No. 21.

FOREST DEPARTMENT, BENGAL.

Annual Summary of Revenue and Expenditure in the different divisions during 1870-71.

Classification.	Direction.	Cooch Behar.	Upper Assam.	Lower Assam.	Chittagong.	Dacca.	Bhaugulpore.	Bhaugulpore sub-division.	Total.
Revenue.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.
I.—Sale of timber at depôts	.....	53,297 13 6	.....	.....	.....	.....	.....	.....	53,297 13 6
II.— Ditto removed by purchaser	.....	3,768 7 6	.....	.....	.....	.....	.....	.....	3,768 7 6
III.—Duty on foreign timber	.....	.....	.....	.....	.....	.....	.....	.....	.....
IV.—Permit fees	.....	960 10 0	.....	.....	.....	.....	.....	.....	960 10 0
V.—Grazing dues and fisheries	.....	1,041 15 0	.....	.....	.....	.....	.....	.....	1,041 15 0
VI.—Sale of fruits, babool pods, &c.	.....	60 2 0	.....	.....	.....	.....	.....	.....	60 2 0
VII.— Ditto confiscated timber	.....	.....	.....	.....	.....	.....	.....	.....	.....
VIII.—Fines and forfeitures	.....	182 2 0	42 0 0	.....	.....	.....	.....	.....	224 2 0
IX.—Miscellaneous	.....	1,422 9 1	188 9 8	7 14 3	74 15 1	.....	40 10 5	55 10 0	1,790 4 6
Total ...	.....	60,733 11 1	230 9 8	7 14 3	74 15 1	.....	40 10 5	55 10 0	61,143 6 6
Expenditure.									
A.—Conservancy and working.									
I.—Timber expenses	.....	8,902 15 0	1,083 1 0	3 14 0	.....	.....	.....	.....	9,989 14 0
II.—Purchase of stock and cattle	.....	2,893 0 0	193 10 0	117 0 0	1,043 10 0	23 12 0	34 11 0	2,293 10 0	6,599 5 0
III.—Feed and keep of cattle	.....	1,073 0 0	984 12 0	131 11 0	.....	.....	216 9 0	163 8 0	2,569 8 0
IV.—Rent of leased forests	.....	.....	.....	.....	.....	.....	.....	.....	.....
V.—Charges in collecting revenue on grass	.....	55 5 0	.....	.....	.....	.....	.....	.....	55 5 0
VI.—Plantations	.....	1,575 9 0	94 12 0	.....	.....	.....	20 7 0	.....	1,690 12 0
VII.—Forest work	.....	100 0 0	38 12 0	.....	.....	.....	.....	.....	138 12 0
VIII.—Forest survey	.....	981 15 0	415 4 0	.....	.....	.....	73 9 0	45 6 0	1,516 2 0
IX.—Experiments on timber	.....	.....	29 8 0	.....	17 0 0	.....	.....	.....	46 8 0
X.—Communications and buildings	.....	1,449 15 0	24 12 0	.....	.....	.....	92 10 0	.....	1,567 5 0
Total conservancy and working ...	.....	17,031 11 0	2,864 7 0	252 9 0	1,060 10 0	23 12 0	437 14 0	2,502 8 0	24,173 7 0
B.—Establishments.									
I.—Salaries	17,610 4 5	11,252 12 0	8,448 1 0	1,889 7 0	2,702 15 0	1,203 7 0	1,439 0 0	2,920 8 0	47,466 6 5
II.—Allowances	2,451 11 9	3,037 15 0	1,190 6 0	386 0 0	782 12 0	347 2 0	330 0 0	717 10 0	9,243 8 9
III.—Contingencies	1,800 11 8	766 8 8	446 7 7	111 15 4	221 8 5	15 14 0	19 5 8	93 12 4	3,476 3 8
Total Establishments ...	21,862 11 10	15,057 3 8	10,084 14 7	2,387 6 4	3,707 3 5	1,566 7 0	1,788 5 8	3,731 14 4	60,186 2 10
Grand Total of Expenditure ...	21,862 11 10	32,088 14 8	12,949 5 7	2,639 15 4	4,767 13 5	1,590 3 0	2,226 3 8	6,234 6 4	84,359 9 10

Form No. 22.

FOREST DEPARTMENT, BENGAL.

Annual Abstract Account of the Cash transactions of the Forest Department, Bengal, during 1870-71.

Heads of Account.	Rs As P	Rs. As. P.
To cash balance in hand on 1st April 1870—		
Sikkim	877 6 6	
Bhutan	2 1 4	
Assam ...	471 0 11	
		1,350 8 9
„ Revenue received—		
Cooch Behar	60,783 11 1	
Upper Assam	230 9 8	
Lower Assam	7 14 3	
Chittagong	74 15 1	
Bhaugulpore	40 10 5	
Ditto sub-division	55 10 0	
		61,143 6 6
„ Remittances from public treasuries—		
Direction ..	21,862 11 10	
Cooch Behar	30,440 8 5	
Upper Assam	11,248 7 1	
Lower Assam	3,100 0 0	
Chittagong	5,042 3 0	
Dacca	1,616 14 0	
Bhaugulpore	2,655 0 0	
Ditto sub-division	5,652 8 2	
		81,618 4 6
„ Official postage ...		276 0 8
„ Mr. Mann's subscriptions to United Service Family Pension Fund		421 3 0
„ Amount payable in England by Mr. Read on account of salary overdrawn when on leave		800 0 0
„ Error in account—		
Upper Assam	0 1 0	
Lower Assam	0 0 6	
		0 1 6
„ Deposits—		
Cooch Behar	64 14 0	
Upper Assam	1,502 3 7	
Lower Assam	106 0 0	
		1,673 1 7
„ Advances recovered—		
Cooch Behar	11,680 8 9	
Upper Assam	2,608 15 10	
Lower Assam	690 0 0	
Chittagong	16 0 0	
Bhaugulpore	1,309 11 0	
Ditto sub-division ...	4 10 0	
		16,309 13 7
Total		1,63,592 8 1

Heads of Account	Rs As P	Rs As P
By expenditure of the Department—		
Direction ...	21,862 11 10	
Cooch Behar	32,088 14 8	
Upper Assam	12 949 5 7	
Lower Assam	2 639 15 4	
Chittagong	4,767 13 5	
Dacca .	1,590 3 0	
Bhaugulpore	2,226 3 8	
Ditto sub-division ...	6,234 6 4	
		84,359 9 10
„ Remittances to State treasuries—		
Cooch Behar		60,315 2 7
„ Official postage		276 0 8
„ Re-payment of deposits—		
Cooch Behar	120 2 0	
Upper Assam ...	1,181 0 3	
		1,301 2 3
„ Advances made—		
Cooch Behar	10,824 13 1	
Upper Assam	2,109 10 4	
Lower Assam	865 5 2	
Chittagong	16 0 0	
Dacca	16 5 0	
Bhaugulpore	1,309 11 0	
Ditto sub-division .	131 6 6	
		15,273 3 1
" Error in account—		
Cooch Behar	0 2 0	
Upper Assam	0 1 0	
Lower Assam ...	0 1 4	
Bhaugulpore sub-division .	0 2 0	
		0 6 4
„ Cash balance in hand on 31st March 1871—		
Cooch Behar	449 15 9	
Upper Assam ..	242 7 11	
Lower Assam . .	398 8 11	
Chittagong	349 4 8	
Dacca	10 6 0	
Bhaugulpore	469 6 9	
Ditto sub-division ..	146 13 4	
		2,066 15 4
Total		1,63,592 8 1

Form No. 23.

FOREST DEPARTMENT, BENGAL.

Annual Statement of Outstandings and Liabilities of the Department on account of Contractor and Disbursers for 1870-71.

		Department Debtor.		Department Creditor.			Balance due
		Recoveries in cash and value of supplies and work done during year.	At close of year.	At commencement of year.	Payments made during year.	At close of year.	To Department (outstandings)
		Rs. As. P.	Rs. As. P.	Rs. As P.	Rs As. P.	Rs. As. P	Rs. As. P.
Carting timber ...	Cooch Behar ...	1,188 13 9	1,188 13 9	4,306 11 9	7,828 12 9	12,135 8 6	10,996 10 9
	Assam ...	.....	.....	... ..	.	...	.... .
Sawing timber ...	Cooch Behar	687 6 9	687 6 9	2,735 2 7	555 1 6	3,290 4 1	2,602 13 4
	Assam	.....	....		..	.	.
Felling & floating	Cooch Behar	4,824 3 0	4,824 3 0	6,435 14 0	313 0 0	6,748 14 0	1,924 11 0
	Assam ...	1,172 15 0	1,172 15 0	.	1,900 0 0	1,900 0 0	727 1 0
Plantations .	Cooch Behar .	.....	.....	.....	75 0 0	75 0 0	75 0 0
	Assam .	...	... ..	...	.....	. .	
Other works ...	Cooch Behar	1,171 9 3	1,171 9 3	281 8 3	922 1 0	1,203 9 3	32 0 0
	Assam ...	53 12 0	53 12 0	.....	96 5 4	96 5 4	42 9 4
	Total .	9,048 11 9	9,048 11 9	13,759 4 7	11,690 4 7	25,449 9 2	16,400 13 5

Form No. 24.

FOREST DEPARTMENT, BENGAL.

Statement of Timber brought to Depôts from the different Forest Divisions during 1870-71.

Name of river or division.	Forest.	Description of timber.	Pieces.	Cubic feet.	Total of each river. Pieces.	Total of each river. Cubic feet
Sikkim Sub-division	Rayeng	Sâl sleepers	459	1,562		
	Sivok	Ditto	445	1,514		
	Sookna	Planks and scantlings	222	.....		
	Loharguric	Sâl sleepers	602	2,048		
	Siligoree	Sâl logs	7	161		
		Sâl sleepers	50	170	1,785	5,455
Bhutan Sub-division	Mooraghat	Sâl logs	10	380		
	Alipore	Karla Kumbers	43	.....		
		Planks and scantlings	47	.....		
	Santrabarry	Sâl sleepers	11	37		
		Planks and scantlings	205	.....		
	Buxa	Sâl logs	2,627	75,703		
		Planks and scantlings	106	.....		
	Doma	Sâl logs	90	2,610		
	Panbarry	Planks and scantlings	38		3,177	78,730
		Total	.....	.....	4,962	84,185

Form No. 25.

FOREST DEPARTMENT, BENGAL.

Annual Timber Account for 1870-71.

Particulars.	Pieces.	Total.
I.—Stock in hand at the following depôts at the commencement of the year—		
1 At Station depôts—		
Logs 2,797		
Sleepers 21,244		
Planks and scantlings 10		
Saplings 486		
Shingles 88,000		
Karla Kumbers 851	1,13,388	
2. At Forest depôts—		
Logs 4,667		
Sleepers 23,464		
Planks and scantlings 241		
Karla Kumbers 370	28,742	1,42,130
II.—Timber received at depôts from the forests—		
1. At Station depôts—		
Logs 17		
Sleepers 50		
Planks and scantlings 47		
Karla Kumbers 43	157	
2. At Forest depôts—		
Logs 2,717		
Sleepers 1,517		
Planks and Scantlings 571	4,805	4,962
Total	...	1,47,092

Particulars.	Pieces.	Total
I.—Timber removed by purchasers from depôts—		
Logs 1,143		
Sleepers 17,434		
Saplings 306		
Planks and scantlings 13		
Karla Kumbers 478	19,374	
II.—Timber lost and used by the department—		
Logs 11		
Sleepers 4,338		
Saplings 180		
Shingles 88,000		
Planks and scantlings 243		
Karla Kumbers 182	92,954	1,12,328
III.—Stock in hand at close of the year—		
1. At Station depôts—		
Logs 1,926		
Sleepers 14,334		
Planks and scantlings 264		
Karla Kumbers 360	16,884	
2. At Forest depôts—		
Logs 7,118		
Sleepers 10,169		
Planks and scantlings 349		
Karla Kumbers 244	17,880	34,764
Total	...	1,47,092

Form No. 26.

FOREST DEPARTMENT, BENGAL.

Statement showing the amount realized on account of the different classes of timber sold during 1870-71.

Divisions.	Number of logs and pieces.	Average cubical contents per log.	Amount realized on account of timber sold.	Average amount per log.	Average amount per ton (50 cubic feet).
Cooch Behar Division.			Rs. As. P.	Rs. As. P	Rs. As. P.
Sál logs	1,125	28′ 0 0	12,665 11 7	11 4 1	20 1 8
Sissoo logs	18	9′ 0 0	18 0 0	1 0 0	5 8 10
Sál sleepers	17,434	3′ 4″ 10‴	29,817 12 0	1 11 4	25 2 1
Planks and scantlings	13	.....	13 12 0	1 0 11	.....
Saplings	306	.....	7 0 0	0 0 4	.....
Karla Kumbers	478	.....	756 8 0	1 9 3	
Total ...	19,374		43,278 11 7		
Deduct amount due but not realized during year			714 10 0		
		Balance ...	42,564 1 7		
Add amount realized on account of former years			368 8 5		
Total shown as revenue on account of timber sales			*42,932 10 0		

* Amount credited in annual summary of revenue is Rs 53,297-13-6; but timber to the value of Rs. 10,365-3-6 has yet to be delivered.

Form No. 27.

FOREST DEPARTMENT, BENGAL.

Statement showing the amount expended on account of timber received from the different Forest Divisions during 1870-71.

Name of Division.	Number of logs.	Cubical contents.	Timber expenses.	Average cubical contents per log.	Average paid per 50 cubic feet.	
Cooch Behar Division.			Rs. As. P.			
Logs	2,734	78,854	14,959 0 0	28′ 10″ 1‴	9 7 9	This timber was felled and partly dragged in former years. The amount shown is expenditure incurred in 1870-71.
Sleepers	1,567	5,331	1,794 4 0	3′ 4″ 10‴	16 13 3	
Planks and scantlings	618	.....	270 6 0			
Karla Kumbers	43	.....	8 1 0			
Total ...	4,962	84,185	17,031 11 0			

Form No. 28.

FOREST DEPARTMENT, BENGAL.

Annual Account of Forest Revenue for the year 1870-71.

	Rs.	As	P.
Receipts	61,143	6	6
Expenditure	84,359	9	10
Deficit	23,216	3	4
Add difference between assets and liabilities	13,820	5	0
Total deficit ...	37,036	8	4

NOTE.—The revenue collected on forest produce by civil officers in the Lower Provinces of Bengal amounted to Rs. 58,534-2-5. If the above deficit be deducted from this sum, a net revenue of Rs. 21,497-10-1 is the result.

Detail of difference between Assets and Liabilities at commencement and close of the year.

	At the commencement of the year.	At the close of the year.	Difference.	
			In favor of the year.	Against the year.
	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As P.
Value of timber	2,91,441 0 0	2,72,657 4 7	....	18,783 11 5
Value of elephants and buffaloes	7,223 0 0	9,148 12 0	1,925 12 0	.....
Outstanding on account of sales...	318 8 5	714 10 0	396 1 7	...
Excess payments, to contractors	13,759 4 7	16,400 13 5	2,641 8 10	.....
Total assets ...	3,12,741 13 0	2,98,921 8 0	4,963 6 5	18,783 11 5
Deduct difference ...	...	.....	.....	4,963 6 5
Balance ...	... ..	.....	.....	13,820 5 0

FOREST DEPARTMENT, BENGAL.

Statement of value of timber in hand on 31*st March* 1871.

Description of Timber.	Quantity.		Estimated selling rate per 1 cubic foot.	Estimated value.
	Number of logs and pieces.	Cubical contents.		
In Station Depôts.			Rs. As. P.	Rs. As. P.
Logs	1,926	75,114	1 8 0	1,12,671 0 0
Sleepers	14,334	48,775	2 6 0 each.	34,043 4 0
Planks and scantlings	264	....*	0 12 0 each.	198 0 0
Karla Kumbers	360	.....	0 4 0 each.	90 0 0
Forest Depôts.				
Logs	7,118	220,658	0 8 0	1,10,329 0 0
Sleepers	10,169	34,602	0 7 0	15,251 14 7
Planks and scantlings	349	.....	0 2 0 each.	43 10 0
Karla Kumbers	244	.....	0 2 0 each.	30 8 0
Total ...	34,764	3,79,149	....	2,72,657 4 7

H. LEEDS,

Conservator of Forests, L. P., Bengal.

APPEDNIX N.

ANNUAL REPORT

OF

FOREST ADMINISTRATION

IN THE

NORTH-WESTERN PROVINCES,

1870-71.

By G. GREIG, Esq.,

OFFG. CONSERVATOR OF FORESTS, N.-W. P.

No. 134, dated Nynee Tal, 19th August, 1871.

From—G. Greig, Esq., *Offg. Conservator of Forests, N.-W. Provinces,*

To—The Secretary to Government, N.-W. Provinces, Public Works Dept.

The Annual Report for 1870-71 has been drawn up on similar principles to those followed by the Conservator last year.

General Summary.

2. The actual results as regards receipts and expenditure, compared with the regular estimate, are as follows:—

	1870-71. *Estimate.* Rs.	1870-71. *Actuals.* Rs.
Receipts, ...	4,80,413	3,63,788
Expenditure, ...	7,55,320	6,73,565
	2,74,907	3,09,777

Thus in the past year the revenue actually realized fell short of the revised estimate by Rs. 1,16,625, whilst the actual expenditure shows a decrease of actuals compared with regular estimate of Rs. 81,755. Only three of the divisions show an increase of revenue over their estimates, *viz.*:—

	Estimate. Rs.	*Actuals.* Rs.	*Surplus.* Rs.
Bhagaruthy, ...	1,100	15,451	14,351
Goruckpore, ...	27,500	31,760	4,260
Rohilkhund, ...	11,376	25,720	14,344
	Total surplus,	...	32,955

3. The Kunkhul Depôt, which was formerly under the Doon officer, was given over to the Bhagaruthy Division during the year. There was a lot of old half-rotten cheer and a few deodar-logs in the depôt which in another year would have become completely rotten and useless: the sale of this old timber accounts for the increase of revenue in the Bhagaruthy Division.

The increase in Goruckpore is mainly due to good European supervision. The revenue in this division increased Rs. 12,000 during the last year. The only reason of there being so large an increase over the estimated revenue in Rohil-

khund is that the Collectors of Bijnour and Bareilly rather underestimated the receipts for 1870-71.

Six divisions show a decrease:—

	Estimate. Rs.	*Actuals.* Rs.	*Decrease.* Rs.
Direction, ...	15	12	3
Kumaon, ...	1,33,895	1,05,601	28,294
Gurhwal, ...	1,79,645	1,11,746	67,899
Dehra Doon,... ...	66,300	31,943	34,357
Jounsar, ...	54,177	36,589	17,588
Jhansie, ...	6,504	4,966	1,439
Total decrease, ...			1,49,580
From which deduct surplus revenue, ...			32,955
Balance, being decrease of revenue below the revised estimate, ...			1,16,625

In Kumaon the decrease is entirely in the Kham Tehseel (Headings II. and VI.)

Owing to the fraud cases in the Doon, Dr. King was not able to take charge of this division until the end of February, so that for the first four months of the working season there was no European officer to look after the work. This, combined with an unusually bad season for the forests, and the suppression, except within a limited space, of the export of dry timber (Government, North-Western Provinces, No. 267$\frac{F}{6}$, dated 29th September, 1870), has caused a decrease of revenue of over Rs. 28,000.

In Gurhwal nearly Rs. 18,000 decrease was in the Kham Tehseel (Headings II. and VI.), and may also be ascribed to the unusually bad season and the stoppage of exporting dry wood as above described. It was supposed that the sâl-timber at depôts would have been sold, and thereby realized Rs. 50,000; but merchants would not bid anything like a reasonable price, and the Public Works Department did not want timber, so that not a bit of it was sold. These two sums account for the deficit in Gurhwal.

Rs. 18,000 of the Doon deficit are due to the Kunkhul Depôt having been transferred to another division, as mentioned in para. 3. Owing to the timber markets being overstocked, only Rs. 8,000 worth of poles were sold (under II.) instead of Rs. 20,000 worth as estimated for; this accounts for Rs. 12,000 more. In Headings IV., V., and VI, there is a deficit of Rs. 3,000, and in VII., VIII., and IX., a further deficit of Rs. 1,000.

JOUNSAR DIVISION.

The Conservator had no data whereon to found the regular estimate for 1870-71, *vide* Forest Department Budget for 1871-72, Jounsar Division, para. II.

In Jhansie the deficit in revenue of Rs. 1,439 may be accounted for by the decrease in expenditure of Rs. 1,692.

As compared with the revenue of last year (1869-70), that of the year under review contrasts unfavourably—

The revenue for 1869-70 being	Rs. 6,48,359
Revenue for 1870-71, only	„ 3,63,788
Decrease, ...	Rs. 2,84,571

The following divisions contribute towards this decrease:—

Kumaon to the extent of	...	...	...	Rs.	1,49,732
Gurhwal	do	...	...	...	„	37,226
Dehra Doon	do.	...	...	...	„	52,309
Jounsar	do.	...	...	...	„	57,074
Rohilkhund	do.	...	...	...	„	8,540
Jhansie	do.	...	...	...	„	2,674
Direction	do.	...	...	...	„	2
		Total decrease,		...	„	3,07,557

Deducted from which must be the increase in the following divisions:—

Bhagaruthy,	...	...	...	Rs. 10,943	
Gorruckpore,	...	...	...	„ 12,043	
		Total increase,		... „	22,986

Net decrease against the year compared with 1869-70, Rs. 2,84,571

This decrease against the year as compared with 1869-70 is mainly attributable to there having been no timber sales in Kumaon, Gurhwal, and Dehra Doon Divisions, owing to the market being overstocked; a less supply of building-timber having been taken by the Public Works Department at Chukrata ; in Rohilkhund, to the making over of a great portion of the forests to Rai Himmut Sing, under decree of the High Court, North Western Provinces. In Jhansie, the revenue of the year 1869-70 was raised nearly Rs. 2,000 by the sale of some grass lands, which was of course an *extraordinary* increase of the year.

Grain has been very cheap all through the Rohilkhund District during the past year; consequently, fewer people have come to the forests to make money. The Kham Tehseel thrives best when food is expensive.

Inspection.

4. I took charge from Major Pearson towards the end of January, 1871. Early in March I went up to the Tonse, and remained in Jounsar until Lieutenant Lillingston arrived (middle of May), and took charge of that division. I then went up to Dartmeer to see the works there, and thence crossed over to the Bhagaruthy.

I.—Conservancy.

5. The early and continuous rains this year have contributed a good deal towards preserving the forests from fire. Next year I mean to concentrate the conservancy establishment on certain portions of the sâl-forests, in which felling operations have been going on during the last few years, and which are now closed. By burning a line 150 feet broad round these blocks in February, and by keeping on burning the line every month till the rains set in, I hope to succeed in preserving some portion of our sâl-forests. More than this cannot be done, for to keep fires out of the large extent of country covered by these sâl-forests would require an enormous outlay, far beyond the benefits to be derived.

The hill forests are comparatively easy to manage. None of the deodar forests were burnt this year ; a few fires broke out, but were soon extinguished, owing to the vigilance of the Forest Officers and their staff.

The dry timber export of Kumaon aud Gurhwal was confined to the tract between the Kosee and Ramgunga Rivers, and it will be necessary to leave this tract open for another year at least, for a large amount of dry timber still remains from

the excessive and injudicious cuttings that were carried on some ten years ago. This suppression of dry timber export materially affects the revenue; but it is most necessary, for it is a well-known fact that the people burn the forests in March and April to enable themselves the more easily to find the timber.

II.—Plantations.

6. The end of last month I was at Raneekhet for three days, and in company with Mr. Craw I inspected the nurseries, gum-tree plantations, &c. The following list of plants, now alive and flourishing, will thoroughly explain how well the wishes of Government have been carried out by Mr. Craw:—

List of Fruit and Forest-trees in the Nurseries and Plantations at Raneekhet, 28th July, 1871.

Fruit-trees, &c., from London, 1870-71 :—		
Apples of sorts, ...	112	
Pears „	39	
Cherries „	15	
Apricots „	30	
Plums „	31	
Gooseberries „	31	
Currants „	40	
Apple-stocks	104	
Cherry „	50	
	——	452
Fruit-trees propagated from the imported plants:—		
Apples of sorts, ...	104	
Pears „	382	
Apricots „	256	
Cherries „	50	
Plums „	228	
	——	1,020
Stock-plants for budding and grafting upon:—		
Apricots, ...	1,545	
Pears, ...	1,545	
Apples, ...	500	
Cherries, ...	100	
	——	3,890
Forest-trees in nursery rows:—		
Gum-trees of sorts, ...	3,750	
Oak, ...	2,350	
Alder, ...	1,363	
Toon, ...	248	
Willow, ...	81	
Gum-seedlings, ...	10,000	
Deodar, Picea, &c., ...	2,000	
	——	19,792
Planted out in Cantonment Forests:—		
Gums of sorts, ...	2,666	
Deodar, ...	638	
	——	3,304
Total, ...		28,458

All the fruit-trees are thriving splendidly, and the grafting and budding is progressing rapidly. The nursery is in perfect order, and it is easy to see that the work is conducted by a man who thoroughly understands his business. The climate and soil of Raneekhet are evidently well suited to the Australian gum-trees. We have now gained considerable experience in the cultivation of these

very valuable trees, and I am convinced that the best mode is to break up patches of ground and sow the seed broadcast on the spots the trees are to remain on; for although the young saplings are not killed by transplanting, their growth is very considerably delayed. The seed should be sown in the rainy season, and it will then germinate in about 8 or 10 days.

The blue gum is doubtless the quickest grower, and will do well enough for fuel, but I doubt its being of much use for timber, and I am rather afraid that it will be liable to get broken by the severe gales of wind peculiar to the Himalayas. I incline to the iron bark and red bark; there is a small patch of these kinds at Doonagiree which was sown during the rainy season of 1865 at an elevation of about 7,000 feet. The patch is about 20 feet long by 8 feet broad, and contains from 40 to 50 trees, all growing as straight as hop-poles; one of the iron barks now measures 22 inches in girth, and red bark 24 inches, and they are 50 feet in hight. Plantations of these trees would be very valuable; for about the fifth or sixth year after sowing they might be thinned out and sold as bullies for roofing Native buildings, out-offices, &c., and by the 10th year they would yield a great quantity of fuel. I have directed Mr. Craw to break up open patches of ground in the forest, and sow all the gum-seed he has, and next year I mean to go on with this work on an extensive scale, and there are many acres of small open spaces on the Raneekhet hill which I hope to get covered with gum-trees in this way.

I have sent a little gum-seed to Lieutenant Lillingston, and requested him to sow it in different situations handy to Chukrata, for the experiments of last year were hardly satisfactory. Captain Ward's trees were all transplanted, and Major Rowland's seed did not germinate very freely, owing, perhaps, to not having been sown at the right season, as the monsoon was far advanced before I sent the seed to Jounsar. I have asked Lieutenant Lillingston to mix some barley or wheat with the gum-seed, so as to protect the young trees from the winter's frost and the summer's drought: this plan answers admirably with deodars; it not only protects them and keeps the ground moist, but it also draws up the young trees and tends to make them grow straight.

III.—Maps and Boundaries.

7. The Surveyor, Mr. Grant, has been out the whole year. During the summer and autumn months he finished the survey of the deodar forests on the Neelung and Jadh Gunga Rivers, and thereby completed his maps of the Gungootree Forest. From November till May he was engaged in the Dehra Doon arranging the forest boundaries with Mr. Cornwall, the Settlement Officer, and cutting lines.

The Doon boundaries are not yet quite settled, but if Mr. Cornwall can be spared for a short time next winter, I think that two months' work will *really* finish this tedious business. Good broad lines being cut, and boundary disputes at an end, the Divisional Officer will see his way much more clearly, and it is to be hoped that with Messrs. Murray and Dick as Assistants, the newly-appointed Deputy Conservator (Mr. Bailey) will be able to show a good increase of revenue.

IV.—Communications.

8. The principal communication works carried out during the past year are as follows:—

(1) Bhagaruthy Valley Road.
(2) Lanka wire-rope Bridge over the Jadh Gunga River, just above its junction with the Bhagaruthy.
(3) Deobun and Tonse Road.
(4) Wire-rope suspension-bridge over the Tonse at Maindrot.
(5) Ditto ditto ditto at Jewnie.

The Bhagaruthy Road works got on very well last year: 16 miles of the road were completed and 15 miles nearly so. Three suspension-bridges were built over the Ganges and one over the Beenee Gadh, and a rest-house was erected at Butwaree.

The Lanka Supension-bridge was reported on by Major Pearson in his No. 14, dated 16th January, 1871.

Thirty-five miles of mule-road, from Deobun to Maindrote, and thence along the left bank of the Tonse to the Jewnie Bridge, were constructed during the year. This is a most useful road; for it connects our Tonse sleeper-works with the plains, and opens out a large tract of forest. The line is excellently chosen, and the work has been well and cheaply executed. It cost about Rs. 360 per mile. During the spring of 1870 a small foot-bridge was put across the Tonse at Maindrote by Mr. De Wolski, of the Engineers. Last winter this was taken down, and another one put up capable of allowing laden ponies, &c., to cross. This was necessary on account of sleeper operations having commenced in the Lambertach Forest, and all the supplies for the workpeople having to cross the Tonse at Maindrote.

The Jewnie Bridge was put up last November by Mr. Harvey, of the Engineers. Owing to a defect in the anchorage, it unfortunately gave way, and had to be entirely taken down and re-erected by the Forest Department.

Besides these five large works, a good many miles of roads and paths were cut in the deodar forests; but these are but temporary works, and need not be detailed.

V.—Timber Operations.

9. (1) Carting of sâl-logs in Kumaon.
(2) Carting operations of sâl-logs and sawing sâl-kurrees in Gurhwal.
(3) Supply of timber to Chukrata.
(4) Sleeper operations on the Tonse and Bhagaruthy.

In Kumaon 737 logs were carted from the forest depôt at Mohan to the regular depôt at Rammuggur, a distance of 12 miles; and 744 were brought down from the Doorgadeh Forest to Mohan. These are part of the logs that were cut for the Public Works Department in 1869-70; but were not taken on account of this work being stopped.

Of the 1,010 logs that remained in the Seemul-chour Depôt in Gurhwal, 741 were carted down to the regular depôt of Sunnye; and great credit is due to Mr. Brereton, the Divisional Officer, for he got no assistance whatever from Motee Ram Sah, the Forest Treasurer, who has formerly always supplied carts. Mr. Brereton also managed his sawing operations very well. He did not receive orders until January, 1871, but by the 20th March he had 26,089 sâl-kurrees prepared, and by the 2nd May they were all landed and stocked in the Sunnye Depôt. These kurrees will be sold early next winter.

From the 1st April, 1870, to the 31st March, 1871, the following is the supply of timber that has been delivered at Chukrata:—

Deodar-planks,	...	... 2,190	=5,812 cubic feet.
„ kurrees,	...	... 1,576	
Rai-planks,	...	... 31,375	=39,533 cubic feet.
„ kurrees,	...	... 5,200	

Sleeper Operations.

10. The sleeper work on the Tonse commenced in October, 1869, but on account of the extreme cold and snow very little was done during the financial year of 1869-70. Up to the end of June 1870, 5,127 sleepers had been sawn,

and carrying had commenced. Up to the 31st May, 1871, 3,121 sleepers had been delivered at Delhi; these were sawn in the Doon from logs sent down the Tonse from Dartmeer, and 20,700 sleepers were in the Tonse River on their way down to the Doon.

Besides these, 12,000 had up to that date been sawn in the forests. This for a commencement is not a bad year's work considering the difficulties that have to be contended with; for all labour has to be got from a distance, and the people fed on grain brought up from the plains. The Jounsar country is so lightly assessed that the inhabitants don't care to work or to grow more grain than is actually necessary for their own consumption. However, Mr. Cornwall is now commencing a new settlement, and this will, in all probability, change the character of the Jounsarees.

I expect a good season's outturn of sleepers in 1871-72, for Lieutenant Lillingston is a very zealous officer, and has a good sound practical knowledge of simple engineering, which he is now bringing into play by inventing some cheap and simple wooden-slides for conveying the sleepers down from the forests to the river.

With Mr. Wilson as contractor, Mr. O'Callaghan, the Deputy Conservator of the Bhagaruthy Division, has done excellent service.

The sleeper work commenced here in April, 1870; there were then 5,000 deodar-logs in the river, which were made over to Mr. Wilson at Rs. 6 per log. 31,000 logs during the summer of 1870 were put into the rivers, of which 21,000 stranded above the Doon when the floods subsided; and the remainder 15,000 were caught and sawn into sleepers.

These 15,000 logs yielded 39,943 sleepers, $10' \times 10'' \times 5''$, and 20,062 small-sized ones, $6' \times 8'' \times 4''$; the whole of which were delivered to the Railway authorities at Delhi.

Mr. O'Callaghan remained down below till the end of May and thoroughly cleared out the river: he realized over Rs. 23,000 from waif-wood, refuse from the sleeper-logs, and a lot of *Pinus longifolia* that was rotting in the Kunkhul Depôt.

VI.—Financial.

11. An explanation of the decrease in revenue has already been given in detail.

The excess of expenditure over receipts is caused by the sleeper operations. These large works have been going on for a year, and no revenue has, as yet, been derived. The price to be paid to this department for sleepers has not been fixed, but in all probability the receipts under this head during 1871-72 for the 40,000 large and 40,000 small sleepers mentioned in para. 10 will be about Rs. 4,00,000. In these sleeper works the result of the expenditure of the year will be seen in the revenue of the year following.

General Remarks.

12. I wish to bring to the notice of Government that the adoption of the narrow gauge reduces the sleepers to such a size ($6' \times 8'' \times 4''$) that they could be brought out of the forests on bullock's backs, thereby doing away with the expense of making cart-roads; and as the timber market appears to be rather overstocked, I would suggest that the sâl-trees growing in such places that they cannot be removed in logs, and which have hitherto been sawn into kurrees, be utilized for railway-sleepers. In Kumaon and Gurhwal there are many such trees, and many crooked ones, that it would be to the interest of forest conservancy to remove.

Sâl-sleepers 6′×8″×4″ might be delivered at the foot of the Sewaliks between Ramnuggur and the Ganges at Re. 1-12-0 each, and the carriage thence to Delhi would not, I fancy, cost more than from 8 to 12 annas.

If timely notice were given, *i.e.*, by the 1st October, we could supply about 80,000 by the end of June. I am not prepared to state for how many years this supply could continue; but if my suggestion be adopted, I could give an opinion on this point during next cold weather.

The Forest Department could arrange for the delivery of these sleepers, and charge the *actual cost-price* of carriage from the foot of the hills to Dehli, over and above the Re. 1-12-0.

Having been so very short a time in office, in place of giving any further remarks of my own, I shall merely append a few extracts from the Divisional Officers' reports.

No. 15.

FOREST DEPARTMENT, N.-W. P.

Statement of Timber on hand on the 31st March, 1871.

Name of Depôt.	Description of Timber.	Quantity. No. of Pieces.	Quantity. Cubic feet.	Estimated selling rate per 100 cubic feet.	Estimated value.	Total per Depôt.
				Rs. a. p.	Rs. a. p.	Rs. a. p.
Ramnuggur (Kumaon), ...	Sâl Logs, ...	1,989	81,408′ 9″ 5‴	125 0 0	1,01,760 15 8	1,01,791 10 8
	„ Gaindas, ...	22	98′ 3″ 0‴	31 4 0	30 11 0	
Sunnye Semul-Chour (Gurhwal), ...	Sâl Logs, ...	1,010	45,809′ 2″ 3‴	100 0 0	45,809 3 0	63,250 1 2
	„ Kurrees, ...	7,247	...	per 100 166 10 8	12,078 5 4	
	„ Koloos, ...	101	3,876′ 2″ 1‴	100 0 0	3,876 2 9	
	„ Gaindas, ...	85	1,400′ 2″ 1‴	75 0 0	1,050 6 1	
	„ Sleepers, ...	218	...	per 100 200 0 0	436 0 0	
Chuckrata (Jounsar), ...	Deodar Kurrees, ...	8,820	10,476′ 7″ 0‴	Different rates.	12,960 0 0	22,988 8 0
	„ Planks, ...	1,951	...	„	2,438 0 0	
	Rai Kurrees and Planks, ...	6,992	...	„	7,306 9 0	
	„ Bullees, ...	77	...	3 11 0 each.	283 15 0	
Miapore (Bhagaruthy), ...	Deodar Kurrees and Sleepers	135	502′ 8″ 0‴	Different rates.	435 6 8	3,858 6 8
	„ Planks, ...	292				
	Cheer Sleepers, ...	1,141	1,521′ 6″ 0‴	Rs. 3 per sleeper.	3,423 0 0	
Sukhni (Goruckpore), ...	Sâl Logs (inferior), ...	783	13,495′ 6″ 11‴	Rs. 3 per 100 ft.	400 0 0	400 0 0
Rehun (Bijnour), ...	Sâl Bullees „ ...	774	...	Re. 0-2-6 each.	123 13 6	123 13 6
Jhansie, ...	Miscellaneous sorts, ...	4,157	Valued with other stock, such as fuel, grass, &c., at		2,750 0 0	2,750 0 0
					Total, ...	1,95,162 8 0

Dated 24th July, 1871.

R. P. COLVIN,
Deputy Conservator.

No. 21.

FOREST DEPARTMENT, N.-W. P.

Annual Summary of Revenue and Expenditure in the different Divisions during the year 1870-71.

CLASSIFICATION.	DIRECTION.	KUMAON.	GURHWAL.	DEHRA DOON.	JOUNSAR.	BHAGARUTHY.	GORUCKPORE	ROHILKHUND.	JHANSIE.	TOTAL.
RECEIPTS.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
I.—Sale of Timber at Depôts, ...	...	7,995 6 6	...	1,804 11 6	25,376 12 6	9,375 15 1	2,404 0 0	2,912 0 0	...	51,269 11 10 —1,400 14 3
II.—Sale of Timber removed by purchasers, ...	...	45,852 13 7	52,665 9 0	8,205 9 2	8,535 5 0	...	10,833 2 5	349 6 6	1,400 14 3	1,26,441 13 8 +1,400 14 3
III.—Duty on Foreign Timber, ...	...	...	...	...	...	...	...	...	...	...
IV.—Permit fees, ...	...	...	...	10,138 2 0	806 8 7	191 9 7	4,524 15 11	...	...	15,661 4 1
V.—Grazing dues, ...	...	8,525 15 10	708 15 11	7,527 3 6	137 10 6	...	6,147 9 0	6,508 6 9	2,617 7 3	32,173 4 9
VI.—Sale of Fruits, &c., ...	...	41,639 6 11	57,425 13 8	3,710 13 1	92 8 0	...	6,188 12 9	15,886 4 0	614 11 6	1,25,558 5 11
VII.—Sale of Confiscated Timber, ...	...	861 5 6	100 0 0	176 3 6	304 1 6	...	7 0 0	...	...	1,448 10 6
VIII.—Fines and Forfeitures, ...	...	596 10 5	536 7 5	169 1 6	430 7 6	...	8 0 0	4 4 0	...	1,744 14 10
IX.—Miscellaneous, ...	12 8 0	128 13 5	308 12 4	211 11 9	905 13 0	5,883 5 6	1,646 5 9	59 8 0	333 4 6	9,490 2 3
X.—Value of Stores returned by Assistant Conservator, Dehra Doon Division, ...	...	...	...	...	...	...	...	...	...	1,287 11 0
TOTAL, RECEIPTS, ...	12 8 0	1,05,600 8 2	1,11,745 10 4	31,943 8 0	36,589 2 7	15,450 14 2	31,759 13 10	25,719 13 3	4,966 5 6	3,63,788 3 10 +287 11 0
CONSERVANCY AND WORKING.										
I.—Timber Expenses, ...	...	71,000 0 0	20,558 2 5	3,987 8 2	1,11,994 12 8	1,13,840 10 11	612 3 0	695 13 2	863 15 4	3,23,553 1 8
II.—Purchases of Stock and Cattle, ...	...	363 10 0	1,997 2 3	1,045 5 4	1,929 7 9	2,822 1 6	...	...	...	8,157 10 10
III.—Feed and Keep of Cattle, ...	...	1,923 12 10	1,205 12 2	4,174 7 8	...	50 7 6	412 0 0	...	5 8 0	7,772 0 2

IV.—Rent of Leased Forests, ...	...	...	...	...	6,000 0 0	18,580 1 9	...	...	...	24,580 1 9
V.—Charges in collecting Revenue on Grass, &c., ...	...	9,359 7 3	9,960 10 3	...	...	...	...	1,004 2 10	407 9 9	20,731 14 1
VI.—Plantations, ...	...	1,715 15 2	...	53 7 3	...	...	24 0 0	...	250 0 0	2,043 6 5
VII.—Forest Work, ...	...	571 7 3	425 9 9	6,323 0 11	2,330 11 8	21 8 0	...	...	443 6 9	10,115 12 4
VIII.—Forest Survey, ...	...	...	48 15 0	2,941 15 0	...	996 8 8	286 4 6	...	...	4,273 11 2
IX.—Experiments on Timber, ...	...	368 4 10	...	...	...	...	...	...	...	368 4 10
X.—Communications and Buildings, ...	...	17,895 11 0	12,498 9 0	4,577 13 6	19,149 3 3	82,581 4 0	350 0 0	3,237 0 0	71 4 9	1,40,360 13 6
Total, Conservancy and Working, ...	...	1,03,198 4 4	46,694 12 10	23,103 9 10	1,41,404 3 4	2,18,892 10 4	1,684 7 6	4,937 0 0	2,041 12 7	5,41,956 12 9
ESTABLISHMENTS.										
I.—Salaries, ...	30,294 4 2	20,906 0 0	9,464 0 0	17,772 0 5	7,740 7 10	9,133 0 0	5,991 5 0	1,928 12 4	1,955 11 4	1,05,185 9 1
II.—Allowances, ...	3,421 2 9	4,176 6 7	1,178 9 9	3,518 1 7	3,278 8 0	2,639 12 9	248 0 0	...	...	18,460 9 5
III.—Contingencies, ...	2,588 3 2	1,055 2 7	819 3 5	1,168 14 7	1,302 8 6	771 9 10	191 12 0	36 15 3	27 13 2	7,962 2 6 +2,320 3 2
Total, Establishments, ...	36,303 10 1	26,137 9 2	11,461 13 2	22,459 0 7	12,321 8 4	12,544 6 7	6,431 1 0	1,965 11 7	1,983 8 6	1,31,608 5 0
GRAND TOTAL EXPENDITURE, ...	36,303 10 1	1,29,335 13 6	58,156 10 0	45,562 10 5	1,53,725 11 8	2,31,437 0 11	8,115 8 6	6,902 11 7	4,025 5 1	6,73,565 1 9 +2,320 3 2*

	Rs.	a.	p.
* Official Postage, ...	1,173	4	4
Cost of Tools supplied by Roorkee Workshop to Jounsar Division, ...	808	3	0
Ditto Scales by ditto to Gurhwal, ...	32	0	0
Ditto Chains ditto ditto, ...	16	2	0
Ditto Hammers ditto to Dehra Doon, ...	20	4	0
Ditto Medicine supplied, ...	270	5	10
Rs.	2,320	3	2*

Dated 24th July, 1871.

R. P. COLVIN,

Deputy Conservator.

No. 22.

FOREST DEPARTMENT, N.-W. P.

DR. *Annual Abstract Account of the Cash Transactions of the Forest Department in the North-Western Provinces.* CR.

Year.	Heads of Account.		Rs. a. p.
1870-71	To Cash balance in hand on 1st April, 1870—		
	Kumaon Division		26,022 2 7
	Gurhwal „		45,291 2 2
	Dehra Doon „ In cash, ... Rs.	69 7 10	
	Dehra Doon „ *Pro formâ* balance, ... „	1,477 6 4	1,546 14 2
	Jounsar Division		1,572 12 8
	Bhagaruthy „		1,464 12 6
	Goruckpore „		717 1 6
	Jhansie „		1,595 15 4
			78,210 12 11
	To Revenue received during the year—		
	Direction Division, ...		12 8 0
	Kumaon „		1,05,600 8 2
	Gurhwal „		1,11,745 10 4
	Dehra Doon „		31,943 8 0
	Jounsar „		36,589 2 7
	Bhagaruthy „		15,450 14 2
	Goruckpore „		31,759 13 10
	Rohilkhund „		25,719 13 11
	Jhansie „		4,966 5 6
			3,63,788 3 10
	To Remittances from State Treasuries—		
	Direction Division (including income tax), ...		35,568 12 10
	Kumaon „ ditto, ...		1,30,534 11 6
			—676 12 0
	Gurhwal „ ditto, ...		63,693 4 0
	Dehra Doon „ ditto, ...		46,454 2 6
	Jounsar „ ditto, ...		1,57,195 6 0
	Bhagaruthy „ ditto, ...		2,33,294 10 3
	Goruckpore „ ditto, ...		8,438 12 6

Year.	Heads of Account.	Rs. a. p.
1870-71	By Expenditure of the Department during the year—	
	Direction Division, ...	36,303 10 1
	Kumaon „	1,29,335 13 6
	Gurhwal „	58,156 10 0
	Dehra Doon „	45,562 10 5
	Jounsar „	1,53,725 11 8
	Bhagaruthy „	2,31,437 0 11
	Goruckpore „	8,115 8 6
	Rohilkhund „	6,902 11 7
	Jhansie „	4,025 5 1
		6,73,565 1 9
	By Remittances to State Treasuries—	
	Direction Division, ...	12 8 0
	Kumaon „	1,32,850 6 6
	Gurhwal „	1,46,994 11 5
	Dehra Doon „	32,352 11 0
	Jounsar „	12,187 11 11
		—482 7 6
	Bhagaruthy „	5,676 4 3
	Goruckpore „	26,588 3 4
	Rohilkhund „	25,719 13 3
	Jhansie „	6,246 5 4
		3,88,628 11 0
		—482 7 6
	By Remittances to Public Works Department in transfer—	
	Dehra Doon Division, ...	262 8 0
	Jounsar „	26,280 12 3
		+481 9 9
	Bhagaruthy „	6,731 6 8
		33,274 10 11
		+481 9 9

Rohilkhund „ ditto, ...	6,902 11 7	
Jhansie „ ditto, ...	3,709 5 7	
	6,85,791 12 9	
	−676 12 0	
To Remittances from Public Works Department—		
Gurhwal Division (from Roorkee Workshops), ...	48 2 0	
Dehra Doon „ (Ditto,)	20 4 0	
Jounsar „ (Ditto,)	808 3 0	
	876 9 0	
To Remittance received—		
By Kumaon Division, from Allahabad Treasury, ...	222 9 9	
To Advances recovered—		
Gurhwal Division,...	76 14 8	
Dehra Doon „	250 0 0	
Kumaon „	676 12 0	
Jounsar „	21,100 0 0	
	21,426 14 8	
	+676 12 0	
To "Government of Madras"—		
Military Fund Subscriptions—Direction Division, ...	760 9 11	
To "Government of India"—		
Military and Orphan Fund Ditto—Kumaon Division, ...	483 0 0	
To Civil Service Funds—Jounsar Division, ...	124 10 7	
	1,368 4 6	
Grand Total, ... Rs.	11,51,685 3 5	

By Advances repaid into Treasuries—		
Kumaon Division, ...		676 12 0
Goruckpore „		462 0 0
By ditto, recoverable—Gurhwal Division, ...		76 14 8
„ Dehra Doon „		250 0 0
„ Jounsar „		19,028 0 0 +0 13 9
„ Bhagaruthy „		3,354 0 0
		23,847 10 8 +0 13 9
By Refunds of Revenue—		
Gurhwal Division, ...		21 0 0
By Cash Balances in hand on 31st March, 1871—		
Direction Division, ...		25 12 8
Gurhwal „		15,605 13 1
Dehra Doon „ In Cash, ...	Rs. 309 8 11	
Dehra Doon „ *Pro formâ* balance, ...	„ 1,477 6 4	
		1,786 15 3
Jounsar „		6,167 15 0
Bhagaruthy „		3,011 9 1
Goruckpore „		5,750 0 0
		32,348 1 1
Grand Total, as per Contra, ... Rs.		11,51,685 3 5

Dated 24th July, 1871.

R. P. COLVIN,

Deputy Conservator.

No. 23.

FOREST DEPARTMENT, N.-W. P.

Annual Statement of Outstandings and Liabilities of the Department on Account of Contractors and Disbursers for the year 1870-71.

Divisions.	Department Debtor.			Department Creditor.			Balances due.	
	At commencement of year.	Recoveries in cash and value of supplies and work done during year.	At close of year.	At commencement of year.	Payments made during year.	At close of year.	To Department (outstandings).	By Department (liabilities).
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Kumaon, ...	...	66,317 10 5	66,317 10 5	10,344 4 11	80,642 13 0	90,987 1 11	24,669 7 6	...
Gurhwal, ...	1,663 6 5	31,171 8 9	32,834 15 2	2,623 1 5	30,127 4 6	32,750 5 11	942 10 9	1,027 4 0
Dehra Doon, ...	...	461 14 1	461 14 1	992 0 7	800 0 0	1,792 0 7	1,330 2 6	...
Jounsar, ...	...	64,480 10 11	64,480 10 11	17,921 14 0	59,715 3 9	77,637 1 9	15,501 1 9	2,344 10 11
Bhagaruthy, ..	8,580 1 9	57,667 1 5	66,247 3 2	3,692 6 4	2,11,300 4 8	2,14,992 11 0	1,48,745 7 10	...
Goruckpore, ...	...	23,320 3 7	23,320 3 7	2,095 15 11	25,303 12 4	27,399 12 3	4,079 8 8	...
Rohilkhund, ...	992 0 0	530 0 0	1,522 0 0	...	1,246 13 2	1,246 13 2	...	275 2 10
Jhansie, ...	...	156 2 9	156 2 9	71 12 9	84 6 0	156 2 9	...	...
Total, ...	11,235 8 2	2,44,105 3 11	2,55,340 12 1	37,741 7 11	4,09,220 9 5	4,46,962 1 4	1,95,268 7 0	3,647 1 9

R. P. COLVIN,
Deputy Conservator.

Dated 24th July, 1871.

No. 24.

FORM A.—FOREST DEPARTMENT, N.-W. P.

_____ DIVISION.

Statement of Timber brought to Depôts from the different Forest Divisons during the year 1870-71.

Name of River or Division.	Forest.	Description of timber.	Pieces, number.	Estimated cubic feet.	Total of each River or Division. Pieces.	Total of each River or Division. Cubic feet.
Kumaon Division,	...	Sâl Logs, ...	776	30,013′ 9″ 1‴	14,261	55,134′ 5″ 11‴
		„ Kurrees, ...	13,485	25,120′ 8″ 10‴		
Gurhwal do., ...	...	„ Sleepers, ...	218	Not measured.	7,465	...
		„ Kurrees, ...	7,247	Do.		
Dehra Doon do., ...	...	Deodar Logs, ...	59	766′ 7″ 0‴	1,512	1,631′ 0″ 0‴
		„ Sleepers, ...	50	170′ 11″ 0‴		
		„ Kurrees, ...	30	45′ 10″ 0‴		
		„ Planks, ...	287	(Not cubically measured).		
		„ Miscellaneous, ...	1,026	Not known.		
		Cheer Logs, ...	60	647′ 8″ 0‴		
Jounsar do., ...	...	Deodar Kurrees, ...	1,449	7,371′ 8″ 0‴	40,729	15,567′ 6″ 0‴
		„ Planks, ...	2,038	Superficially measured.		
		Rai Kurrees, ...	5,382	8,195′ 10″ 0‴		
		„ Planks, ...	31,860	Superficially measured.		
Bhagaruthy do., ...	...	Cheer Sleepers, ...	1,141	1,521′ 4″ 0‴	1,141	1,521′ 4″ 0‴
Rohilkhund (Bijnour), ...	...	Sâl Logs, ...	40	Old pieces.	7,814	...
		„ Bullahs, ...	7,774			
Jhansie Division, ...	...	Miscellaneous sorts, ...	4,927	...	4,927	...
			Total Number of Pieces,		77,849	

R. P. COLVIN,
Deputy. Conservator.

Dated 24th July, 1871.

No. 25.

FORM B.—FOREST DEPARTMENT, N-W P.

Annual Timber Account for 1870-71.

Particulars. Headings and Divisions.	Sál logs.	Sál kurrees.	Sál—all other kinds of.	Deodar logs.	Deodar kurrees and sleepers.	Deodar planks and Rai kurrees.	Bulleys.	Cheer logs.	Other kinds.	Pieces.	Totals.
I.—Stock in hand at the Depôts of the following Divisions at the commencement of the year :—											
Kumaon, ...	1,245	12,834	33	...	...	...	...	...	...	14,112	
Gurhwal, ...	1,010	...	186	...	...	...	...	...	...	1,196	
Dehra Doon, ...	...	...	...	789	923	155	...	1,609	351	3,827	
Bhagaruthy, ...	...	...	...	...	...	...	...	...	...	...	
Jounsar, ...	...	...	...	...	7,747	370	485	...	...	8,602	
Goruckpore, ...	1,614	...	...	...	...	...	...	...	...	1,614	
Jhansie, ...	...	...	...	...	...	...	...	...	3,004	3,004	
Rohilkhund (Bijnour),	...	...	...	...	...	...	17,000	...	...	17,000	
											49,355
II.—Timber received at Depôts from the Forests during the year :—											
Kumaon, ...	776	13,485	...	...	...	...	...	...	...	14,261	
Gurhwal, ...	...	7,247	218	...	...	...	...	...	...	7,465	
Dehra Doon, ...	...	...	...	59	80	287	...	60	1,026	1,512	
Bhagaruthy, ...	...	...	...	...	...	...	...	1,141	...	1,141	
Jounsar, ...	...	...	...	...	1,449	39,280	...	...	...	40,729	
Goruckpore, ...	...	...	...	...	...	...	...	...	...	...	
Jhansie, ...	...	...	...	...	...	...	...	...	4,927	4,927	
Rohilkhund (Bijnour),	40	...	...	...	...	...	7,774	...	...	7,814	
											77,849
(Nominal receipt by transfer from Dehra Doon Division). Bhagaruthy Division,	...	...	...	758	1,003	292	...	1,669	351	4,073	4,073
Grand Total, Pieces,...										...	1,31,277

Particulars. Headings and Divisions.	Sál logs.	Sál kurrees.	Sál—all other kinds of.	Deodar logs.	Deodar kurrees and sleepers.	Deodar planks and Rai kurrees.	Bulleys.	Cheer logs.	Other kinds.	Pieces.	Totals.
I.—Timber removed by Purchasers from Depôts during the year :—											
Kumaon, ...	32	26,293	...	...	...	...	...	...	...	26,325	
Gurhwal, ...	...	...	...	...	...	...	...	...	...	...	
Dehra Doon, ...	...	...	...	...	...	150	...	...	1,026	1,176	
Bhagaruthy, ...	...	...	...	758	868	...	...	1,669	351	3,646	
Jounsar, ...	...	...	...	...	364	28,486	397	...	...	29,247	
Goruckpore, ...	831	...	...	...	...	...	...	...	...	831	
Jhansie, ...	...	...	...	...	...	...	...	...	3,774	3,774	
Rohilkhund (Bijnour)	40	...	...	...	...	...	24,000	...	...	24,040	
											89,039
II.—Timber lost during the year :—											
Kumaon Division, ...	...	26	11	...	...	...	...	...	...	37	
Dehra Doon ...	...	...	...	90	Converted into planks.				...	4,163	
Ditto (transferred to garuthy Division, ...	...	...	...	758	1,003	292	...	1,669	351		
Jounsar Division,* .	...	...	...	...	12	2,221	11	...	...	2,244	
											6,444
III.—Stock in hand at the close of the year at the following Depôts:—											
Kumaon, ...	1,989	...	22	...	...	...	..	...	...	2,011	
Gurhwal, ...	1,010	7,247	404	...	...	...	...	...	...	8,661	
Dehra Doon, ...	...	...	...	...	...	...	...	...	...	...	
Bhagaruthy, ...	...	...	...	...	135	292	...	1,141	...	1,568	
Jounsar, ...	...	...	...	...	8,820	8,943	77	...	...	17,840	
Goruckpore, ...	783	...	...	...	...	...	...	...	...	783	
Jhansie, ...	...	...	...	...	...	...	...	...	4,157	4,157	
Rohilkhund (Bijnour),	...	...	...	...	...	...	774	...	...	774	
											35,794
Grand Total, Pieces, ...										...	1,31,277

Nynee Tal:
The 24th July, 1871.

* Used on Local Works.

R. P. COLVIN,
Deputy Conservator.

No. 26.

FOREST DEPARTMENT, N.-W. P.

Statement showing the Amount Realized on Account of the different classes of Timber sold during 1870-71.

Divisions.	Number of logs and pieces sold.	Cubical contents.	Amount realized and due on account of timber sold.	Average amount per log or piece.	Average cubical contents of logs and pieces.	Average amount per 100 cubic feet.
	C. ft.	C. ft.	Rs. a. p.	Rs. a. p.	C. ft.	Rs. a. p.
Kumaon, ...	26,325	45,159	25,648 3 1	0 15 6	1·75	56 12 6
Gurhwal, ...	...	...	...	...	...	...
Dehra Doon, ...	1,176	...	1,107 0 0	0 15 0	...	...
Jounsar, ...	29,247	...	31,527 15 4	1 1 3	...	...
Bhagaruthy, ...	3,646	26,722	4,832 0 5	1 4 9	7·30	18 0 0
Goruckpore, ...	831	9,201	4,003 0 8	4 13 0		43 8 0
Jhansie, ...	3,774	...	...	Proceeds credited to Head II.		...
Rohilkhund, ...	24,040	...	2,912 0 0	0 1 10	...	...
	89,039	...	70,030 10 10	...	...	...
Deduct amount due but not realized during the year, ...			28,219 15 8			
Balance, ...			41,810 11 2			
Add amount realized on account of former years, ...			8,058 2 5			
Add also amount realized for other kinds of Timber, ...			...			
Total shown as Revenue on account of Timber Sales, ...			49,868 13 7			

Remarks.	Pieces.
Timber sold in previous years remaining unremoved at the commencement of the year, ...	*Nil.*
Timber sold during the year, ...	89,039
Total, ...	89,039
Timber remaining unremoved at the close of the year, ...	3,219
Balance removed from depôts by purchasers during the year, ...	85,820

Dated 24th July, 1871.

R. P. COLVIN,

Deputy Conservator.

No. 27.

FOREST DEPARTMENT, N.-W. P.

Statement showing the Amount Expended on Account of Timber received from the different Forest Divisions during 1870-71.

Name of Division.	Number of logs and pieces.	Cubical contents.	Timber expenses.	Conservancy expenses, cost of Establishment, &c., of the Department, including Direction.	Total amount expended, including Direction.	Average amount paid per log or piece.	Average cubical contents per log or piece.	Average Amount paid per 100 cubic feet.	Remarks.
		C. ft.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	C. ft.	Rs. a. p.	
Kumaon, ...	14,261	55,134	71,000 0 0	5,060 0 0	76,060 0 0	5 5 0	3·85	138 0 0	
Gurhwal, ...	7,465	...	20,558 0 0	359 0 0	20,917 0 0	2 13 0	...	...	No cubic measurements.
Dehra Doon, ...	1,512	1,631	3,987 0 0	1,356 0 0	5,343 0 0	3 8 0	...	...	Last two columns not filled in, as so much of the timber was never cubically measured.
Jounsar, ...	40,729	15,567	1,11,995 0 0	37,723 0 0	1,49,718 0 0	3 10 0	...	...	Do. do.
Bhagaruthy, ...	1,141	1,521	1,13,841 0 0	78,317 0 0	1,92,158 0 0	...	...	...	No averages given, as nearly all the expenses were for railway sleepers.
Rohilkhund (Bijnour), ...	7,814	...	696 0 0	497 0 0	1,193 0 0	0 2 5	...	...	No cubic measurements.
Jhansie, ...	4,927	...	864 0 0	790 0 0	1,654 0 0	0 5 4	...	...	

Dated 19*th August*, 1871.

R. P. COLVIN,

Deputy Commissioner.

No. 28.

FOREST DEPARTMENT, N.-W. P.

Annual Account of Forest Revenue for the year 1870-71.

	Rs.
Receipts, ...	3,63,788
Expenditure, ...	6,73,565
Deficit to be subtracted, ...	3,09,777
From difference between Assests and Liabilities at the commencement and close of the year, ...	5,11,718
Net Revenue, ...	2,01,941

NOTE.—Besides the above sums, which show the actual transactions on timber brought into the depôts, the value of timber in various states in the Forests and in transit may be approximately estimated at Rs._____

Detail of Difference between Assets and Liabilities at the commencement and close of the year.

	At the commencement of the year.	At the close of the year.	DIFFERENCE. In favour of the year.	DIFFERENCE. Against the year.
	Rs.	Rs.	Rs.	Rs.
Value of Timber and other Stock, ...	1,60,888	*5,07,490	3,46,602	...
Outstanding on account of Sales and Excess Payments to Contractors,... ...	37,741	1,95,268	1,57,527	...
Total Assests, ...	1,98,629	7,02,758	5,04,129	...
Deduct Liabilities, ...	11,236	3,647	7,589	...
Total in favour of the year, ...			5,11,718	...

* Rs. 1,95,162 for timber in depôts on 31st March, 1871.
„ 3,12,328 for sleepers delivered at Delhi up to 31st March, 1871.

Dated 19*th August*, 1871.

R. P. COLVIN,

Deputy Conservator,

KUMAON DIVISION.

Under Dr. King, *Inspector of Forests.*

During the six weeks from my taking charge of the division to end of year (31st March), I was able to do little more than go along the Kham Tehseel Chowkies and visit the Depôts of Ramnuggur and Mohan, and the forest of Doorgadeh. I had not time to make any special examination of any particular forest. With regard to forest roads, I would remark that those leading from Doorgadeh to the Mohan Depôt, and from Birumdeo to the forest on the Sarda, were not repaired this season, as, owing to the late period at which I took charge of the division, there was but little chance of their being finished in time to be of much use. The former road ought to be put in hand early next season.

Kham Tehseel.

The exports under Headings II. and VI. come under this. During the past year Rs. 87,492-4-6 have been realized from these sources. This shows a decrease on last year's revenue of Rs. 21,880-1-7, and a deficiency on the budget-estimate of Rs. 36,507-11-6. The causes of the deficiency on the estimated revenue under Heading II., are that a sum of Rs. 7,000 received on account of the sale of kurrees to Motee Ram has been transferred (by order) to Heading I. The causes of deficiency under Heading VI. are depression of the trade in forest-produce, from the stock of former years remaining on the hands of dealers unsold; and also from the goodness of the harvest and consequent low price of grain, the trade in forest-produce invariably being largest in dear years. In spite, however, of these causes, the revenue might have been better, had not the export of dry sâl-timber been suppressed over the greater part of the division. But this measure, although it has had the effect of lessening revenue for the present, is, I am convinced, a most wise one. It must be remembered that (as above shown) Government has a large stock of timber on hand in depôt, and that the dry sâl brought out of the forests by exporters comes in to competition with it to a very considerable extent indeed. The duty charged on dry timber of any scantling is 4 annas per cubic foot, while the price asked by Government for timber at the depôt is one rupee four annas per cubic foot for unpicked, and four annas more for picked logs. It may be said that the dry timber taken out by exporters is so much smaller that it does not really affect the sale of logs from the depôt. I disagree with this view, for I have seen very fine big beams passing out as dry wood; moreover, for Native buildings long scantlings are not required, and an unlimited supply of short scantlings at the cheaper rate must undoubtedly interfere with the sale of the depôt timber.

7. On the 1st October, 1870, orders were issued for the remission of duty upon certain articles on which during the previous year above Rs. 1,800 had been realized, and orders have been recently received for the remission of the duty levied upon skins, which will cut off a further sum of about Rs. 3,000 from the annual revenue.

GURHWAL DIVISION.

Under Mr. Brereton.

Yield of Forest.

In addition, carting operations have been carried on, though commenced late, owing to some altercation I had with the Rampore cartmen through the Forest Treasurer. When I found the Rampore men positively refused to work, despite all inducements, I had as many logs as possible brought down by carts of Nujeebabad and Nugeena, and I think the fact of having brought down and depôted 741 out of 1,010 logs by these little carts speaks well for the

contractor (Chirinjee Lall of Roorkee) and his agent. Some logs were brought down also by one Suleyman of Nujeebabad; but as his men were detected in cutting up an old log which had floated down stream in the rains, and this was the second offence of this nature, his contract was cancelled, and the men removed. Had we commenced a month earlier, I feel satisfied that the whole number of logs would have been landed at Sunnye.

Minor Forest Produce.

The kham revenue though rather less than last year, is still very good. Last year was a particularly good one, and I think the speculative supply rather exceeded the demand; and this fact, together with that of the cutters entering later than usual, on account of the sickness in the Bhabur and plains during the commencement of the season, will account for the falling-off in total. Dry wood is of course very much less than formerly, owing to the closing of the forests; and although it remains to be proved whether the forests will derive a benefit equivalent to the loss sustained in this branch of revenue, yet the experiment is well worth trying.

General Remarks.

The year under report has been a bad one for the Gurhwal Division in every respect. The fact of the Sunnye Depôt having been cleared out last year, and no more wood either in logs or in kurrees having been brought down, precluded all hope of any sales during the season just closed, and consequently the anticipated revenue from this head was not realized. The Kham Tehseel has also suffered both in the item of dry wood export and miscellaneous produce; the former, on account of the order received in the middle of the working-season to close the forests, and the strictness with which it was adhered to, and the latter from an unhealthy cold season at the commencement, which left the forests comparatively empty of wood and bamboo-cutters till the month of January.

It is particularly to be regretted that the kham revenue is less than last year, as I established a much stronger check establishment with great trouble and perseverance (for every Native subordinate was against it at first as being something new, and to which they were unaccustomed), and after placing intelligent peons who could read and write at all outlets where produce was likely to pass, and warning all dealers that they were bound under a penalty to give up their passes to those stationed to receive them: the result was that the number of passes taken (and consequently produce scrutinized) rose from 25 to over 90 per cent. This of course was satisfactory to me as proving the success of my scheme, but I should have liked the revenue to have increased (which it in a favourable year certainly would have done), in order that the effort might financially have attained that success which was originally expected.

I very much fear that under existing circumstances there are small hopes at present of selling the depôt timber at a remunerative price. Local merchants will not look at it, and when the fact of equally good wood being taken out under the "khâm" rules as dry wood at four annas per cubic foot be remembered, it is not surprising. The great reduction of works of the Public Works Department renders it hopeless that the wood can be taken by them, and the present progress of the Eastern Ganges Canal Department renders the sale equally uncertain. For sawn scantlings (kurrees) there is a better demand, and fair prices may yet be realized, but I think that even in this class of wood the supply may exceed the demand. In any case the work should be carried on by Government agency, and not by merchants and dealers; the experimental work of the latter on the Ganges, in "Sein" kurrees, proving, if not a failure, at least unsatisfactory, my opinion being that the dealers did not aim so much at carrying out a good sound season's work as to getting a foothold in our forests, whereby they might expedite their smuggling propensities, so common on the other side of the river. Indeed, if the strictest measures

had not been instituted, and rules laid down, such as eventually entailed, if not actual loss, at least not much profit to the dealers, and their operations had not been closely watched, I believe that an opening would have been gained this season for a future system of pilfering such as it has cost us the total closing of the Chandee Forests to eradicate. It will be far better to carry on all sawing operations by *bonâ fide* Government agency, and to land the wood on the banks of the river, where it should meet with a ready sale.

DEHRA DOON DIVISION.

Under Capt. Murray.

There remains but the boundary-lines to notice. The ones in the Western Doon are completed as far as marking-off goes, and pillars up, but the substructure being of loose boulders, I would recommend masonry ones being erected as sanctioned for the Eastern Doon.

In the Eastern Doon the boundary works may be nearly considered as complete, the pillars only being wanting: some had been erected when the rains put a stop to the work. By December next all should be completed.

Outside the Sewaliks it will be necessary for a Civil officer to verify the bound, as in the Doon. A portion of the West Saharunpore District is still unsettled, Mr. Powell having refused to come to terms. All these matters should be looked to in the coming cold weather.

Although the boundary-lines are completed as far as cutting down trees and marking-off, much remains to be done that they may be kept clear. The mere cutting of grass and saplings will take some Rs. 3,500, and if the work be thoroughly done of grubbing roots, &c., &c., not less than Rs. 10,000 will suffice, with perhaps Rs 1,000 a year then to keep the lines clear.

APPEDNIX O.

REPORT ON PUNJAB FOREST ADMINISTRATION FOR 1870-71.

INTRODUCTION.

Object of the introduction.

1. IN last year's report a detailed introduction was written, dealing with the status of the forests, and the rules and laws by which they were governed ; the general description and statistical account still remains to be written, and I hope that when Dr. Stewart resumes charge, in the next annual report it may appear. I have only to note the changes that have taken place.

River rules.

2. A series of rules for the control of rivers and of floating operations, drawn up by me, have been sanctioned by the Government of India, and been issued under Act VII. of 1865. It was explained in a former report that it was not deemed necessary to draw up a code of rules for forests as well as rivers, because the very defective state of the existing law (Act VII. of 1865) rendered it impossible to draw up a really satisfactory code, which should deal effectively with all the points on which rules are required.

Hazara rules.

3. The Hazara district being under a special law, the forests have been provided for by a complete code of rules sanctioned as required by law by His Honor the Lieutenant-Governor. The rules are the joint work of Captain Wace, the Settlement Officer, and myself.

Chumba lease and rules.

4. The long-continued difficulty about the Chumba Forests has also been brought to a termination. Under the orders of Government, I have prepared a re-draft of the lease, to which a code of rules has been added as a schedule. This places all the moot points satisfactorily at rest.

Hitherto it has been difficult to secure conservancy, or any control over felling, or any satisfactory restriction of injurious forest rights.

Principle of the rules.

5. The rules are on the basis that certain forests are to be demarcated and reserved, others to be left unreserved ; the former are to be under exclusive control of the officers appointed by the British Government, the latter to be managed by the Superintendent of the Chumba State for the benefit of the Raja, and for the supply of such privileges,—free timber and fuel, grazing, &c., &c.,—as the people are allowed.

6. The reserved forests are absolutely closed against all forest rights whatever ; but inasmuch as it may happen that the reservation of certain forests would deprive villages in the vicinity of their actual requirements and otherwise inflict inconvenience, the rules contain a special proviso that in such cases certain privileges may be allowed under permit and control of the forest officer. Care has been taken that the really dangerous practices of grass-burning, lopping and scraping up for manure of the moss, scrub and decaying materials,* &c., which form the natural shelter and means of enriching the forest soil, are under all circumstances absolutely interdicted.

* Conveniently designated by German foresters in one word, *Streunutzung*.

Similar to those of Hazara.

7. These rules are very similar in detail and identical in principle with those of Hazara.

New Forest Act much needed.

8. The passing, however, of a good forest bill, which will enable general rules to be made for preserving the woodlands or fuel-reserves of the plains, and for such of the Hill forests as are in the British territory, is a matter of urgent necessity. It is needless to remark that the existence of numerous centres of work for the new railways render the conservancy of fuel and timber matters of absolute necessity. Rukhs in Multan and other distant localities are now coming into use, and when they are cut a complete provision for closing them with a view to reproduction and punishing trespass and excluding grazing rights is necessary.

9. The only other subject that needs satisfactory settlement is the vexed question of the waif rights and rights of river control on the rivers coming from forests and passing through Native States.

Waif rights in Native States.

I hope to settle these matters as regards the Sutlej and the Bussahir Forests this year at Simla.

I read a paper on the subject before the Forest Conference of 1870, and think that it will be well if the whole subject is thoroughly ventilated and discussed at the next conference in 1871.

10. I cannot conclude the introduction without expressing the satisfaction that the officers of this department have felt at the sanction of the Local Government to the repetition of the Forest Conference.

Forest Conference.

11. If subjects for discussion are notified beforehand, and special reports and papers got ready, and the proceedings carried on in a business-like manner, I am confident that the discussion of subjects by the assembled officers, each fresh with the experience of the different rivers and forests, will be found materially to facilitate the proper administration of the forests ; while the interest and emulation which is thus excited in forest matters has a most beneficial influence on the character and services of the staff.

SPECIAL REPORT.

Chapter I.—State and leased State Forests.

Section I.—Area, boundaries, &c.

12. In para. 31 of last year's report I enumerated the forests. I have now to note the progress made in the transfer, demarcation, &c.

13. I.—*The Hazara Forests.*—The year was occupied with the preliminaries of determining the rules before alluded to and the principles on which demarcation and reservation of forests should be made. The work is at the present moment in full progress. Mr. Reynolds, Assistant Conservator of Forests, who is an accomplished Surveyor, is with Captain Wace, the Settlement Officer, surveying and demarcating the reserve forests.

Transfer of Hazara forests.

14. I have thought it best to place Mr. Reynolds in direct relation with the Settlement Officer to receive instructions from him. Any question that may arise about the reservation of a particular tract is settled by Captain Wace in consultation with the Divisional Officer, and Mr. Reynolds makes survey and demarcation according to the decision arrived at. They have commenced from the Murree end, and I hope to have the first range, called the Dungagullee range, finished and handed over before long. As each range is finished it will be handed over to this department till the whole is transferred. I hope then that a valuation survey will be made and a working plan prepared. It is to be remembered that the early orders of Government place it beyond all question that the Hazara forests are not the property of the State. They are and always have been the property of the people, but Government has wisely, from the earliest days of our rule, insisted on its right to manage the forests, to take from them such timber as it wanted for the public service and general supply (on payment for the same), reserving from the income a fixed portion to pay for conservancy, and paying back the rest to the communities entitled thereto.

Reasons for procedure.

Status of Hazara forests hitherto misunderstood.

Any one who carefully peruses the old Rules in Chief Commissioner's No. 95, dated 19th January 1857, to the Commissioner of Peshâwar, will perceive this to be the status of the forests.

A very erroneous account of these matters is given in para. 4 of a memo. on the Hazara forests (Proceedings for November 1866, p. 21).

15. *The Rawalpindi Forests.*—As the extension of the Northern (State) Railway to Rawalpindi appeared probable, it became necessary to take steps for increasing the area of forest land capable of yielding fuel.

Transfer of Rawalpindi forests.

Previously to this year the actual forests near Murree had been transferred and a certain portion of the sub-montane woodland which came into the rukhs of the 1st class, as classified by Major Hall, Deputy Commissioner, in 1865.

16. We have now completed the area by taking over the rest of the 1st class rukhs and the whole of those in Class II.

The Class III. rukhs having merely grazing grounds remain under the district, and will hardly require any forest establishment on them. I have already submitted to the Financial Commissioner a register of rukhs so taken over, a complete schedule of establishment showing the beat and residence of every individual Forest officer down to the lowest grade, and a table of rates and prices of wood, grass and other products, which has been assimilated to that issued by Captain Wace and myself for Hazara. I only await the formal recognition of my proposals, and this portion of the country will be finally transferred and settled. With the sanction of Local Government I have at present placed an Assistant Conservator in charge of this rukh, understanding that although the normal establishment of the division before this transfer took place was one Deputy Conservator and one Assistant, there is no objection to placing an Assistant there from some other division whence he could be spared. The exercise of a discretion in matters of posting, involving no increase in establishment, is a matter of necessity.

Hushyarpore forests reserving

16½. *Hushyarpore Forests.*—The re-survey reported in para. 50 of last year's report has been brought to a satisfactory conclusion as regards a principal part of the great Lohara tract. At first, it will be recollected, great difficulty was found in managing the first. The rights of the State, once absolute (of this there can be no sort of doubt), had been let go till it became stereotyped by the rules of 1859, which are laid under the Indian Councils' Act, that only the right in the trees belonged to Government, and that even then a portion of the proceeds was to be paid to the villagers; grazing rights to the people were a matter of course, and, what is worse, as the soil was the people's, directly mature trees were felled, the soil reverted, the State right ceased, and it was impossible to plant or reproduce, except in such limited manner as naturally came to pass, in spite of the effort of cattle and fires.

Principles of settlements.

17. The occasion of the resettlement of the district was seized to try and effect a modification by consent. Meetings of the people were held, and the Settlement Officer has recently sent me in a statement by which we have given up a desultory right over the whole of forest, securing in return the *absolute* proprietary right in certain compact tracts free of all grazing and other rights. The terms have been seized and sealed by all the villages concerned and entered on the administration paper in the settlement records. The terms agreed to are 8 in number, as follows :—

18. *Forms of Agreement.*

I.—That certain plots should be demarcated and shall be called reserved forests. These will be the exclusive property of Government.

II.—*All* trees growing in revenue-paying lands should belong to the owners of the soil.

III.—The remaining forests to belong to the zemindars on these terms :—

1.—The lumberdar is to see that trees are not needlessly cut, and to be responsible for carrying out these rules.

2.—No person to sell wood or charcoal by way of trade.

3.—Verbal permission from the lumberdar to be sufficient to enable any *khewutdar* to cut free of charge green or dry wood for marriage ceremonies and cremation of dead bodies.

IV.—Khewutdars to have the privilege of cutting Chil trees for necessary purposes other than those specified in rule 3, on payment of Rs. 0-4-0 for every tree so cut. The money so realized to be credited to the village common fund (mulbah).

V.—Government reserves to itself the right to cut or cause to be cut any trees growing in village forests, and when Government shall think fit to exercise this right a responsible forest official shall be

deputed to blaze all such trees, and a sum not less than half the current rate of the day for a similar kind of tree in Government forests shall be paid to the village lumberdar for every tree cut, to be *credited to mulbah.*

VI.—Whenever a *bonâ fide* private holding shall be situated within the contemplated boundary of a reserved forest, the owner shall be entitled to, in the event of his relinquishing the same, an equivalent from these forests previous to the other land being made over to the village. But such arrangement shall give the party receiving the equivalent no superior claim to standing timber on the land so made over, unless the original plot has been subject to the payment of Government revenue.

VII.—Any guddee who shall have been considered at the present revision of settlement to have a claim to pasturage in the forest lands of any village shall be entitled to a sufficient pasturage for his flocks in the Reserved Forests ; provided the aggregate of his flock do not exceed the average number admitted during the past years ; and henceforth guddees shall not be entitled to claim *as a right* pasturage in the village forests.

VIII.—Government will not undertake to supply from reserved forests any description of forest produce hitherto claimed as a right or granted as a privilege to the keepers of temples or promoters of fairs, &c. ; all such demands must be met by village communities from village forests.

* My No. 248, June 13th, to Financial Commissioner.

19. The details of these are just now being submitted, and would have been so before, had I not been obliged to wait for certain figures.*

20. These terms being thus agreed to, the remainder of the forest land of Lohara will be treated in the same way, and the completion of the demarcation is, now that the principle is acknowledged, a mere matter of routine. The forest of *Panjl Khas* and the Bamboo forests are not on the same basis, but are absolutely the property of the State, as explained in my report on these forests, 1869. This should not be lost sight of.

21. The demarcation has been effected by pillars. Mr. Duff writes :—

" The new pillars were made thus :—A circular hole, 1½ feet deep and 4 feet in diameter, being made, a squared post 6 feet high was set up in the centre of the whole, and stones built round it to the height of 3½ feet, leaving 2½ feet of post visible above the masonry. It was necessary to make the base of the pillars 4 feet in diameter to prevent cattle knocking them down by rubbing against them ; a clear space 10 feet wide was then cut round the outside of these forests."

Mr. Duff's work.

22. The praise that is due to Mr. G. Duff, Assistant Conservator of Forests, who brought about this agreement with the people, must here be rendered. It is not too much to say that without his tact, his knowledge of the people, and his conduct, conciliatory yet firm, this settlement could not have been effected.

23. I have spoken of these terms as *concluded*, though they have not received formal sanction as yet, but I think they will recommend themselves beyond a question.

Kangra Forests.

24. *Kangra Forests.*—I am in hopes that before another year there will be a completed transfer. In November 1870, I urged that something should be done, and received, in February 1871, the orders of Government to take steps in communication with the civil authorities. I have since received a note on the forests of Noorpoor and Hamirpore, and shall propose their transfer, but to arrange terms is a matter of much difficulty. Thus in a letter No. 347, dated 6th June 1867, certain regulations, 11 in number, were laid down (Proceedings April 1868, page 7) ; but Mr. Lyall, the Settlement Officer, afterwards proposed certain modification, of the regulations, and Mr. Brandis also (Proceedings for March 1869, page 1) reported on the proposals. I have also written from time to time, but do not find anywhere that a definite order either modifying the 11 regulations or disapproving of Mr. Lyall's proposals has anywhere been issued.

Difficulty of arranging terms.

25. *Kulu Valley.*—No new transfer was effected during the year, but it is clear that there are still tracts in Seoraj and elsewhere which ought to be reserved. Mr. Duff has visited these with a view of submitting an application on their transfer, and all the forests in Kulu have been mapped.

Kulu.

26. *Kachhi Khisham Forest.*—This has been visited and surveyed during the year. A general map shewing the position of some 14 compact forest blocks together with maps of each block has been made. A report on the whole and proposals for the purchase of the proprietor's right in waste lands included have been submitted, the terms proposed having already been approved of in principle by the Government of India. The report and proposals will probably be printed separately hereafter. It is definitely intended to attach the charge of the Kachhi to the Northern Sub-Division of the fuel reserve division, as that division includes Jhelum and Shahpoor, and from that end of the division across to the Kachhi is easy.

Kachhi.

27. Mr. Ellis, the Officer charged with the survey, deserves much credit for the work he has done and the intelligent interest in it he has envinced.

Mr. Ellis's services.

28. *The woodlands of the plains.*—Final proposals have now been submitted, copy of which forms *Appendix A.* to this report. The proposals include all "rukh" lands that are desired, with the exception of those of the Derajat. If these are to be eventually transferred, it will be necessary to have an officer specially for the charge. But these rukhs may be taken over at any time without affecting the arrangement now proposed.

The Rukhs.

29. A final scheme of establishment has been drawn out, which shows the extent of the area provided for and the changes of each official.

Establishment.

30. *Goordaspore Cheel Forest.*—The re-settlement of the Shahpore and Kundi talookas give opportunity for the demarcation of these forests of "Chil" *(P. longifolia)* and brushwood. The principles of selection are detailed by the Settlement Commissioner—(see Proceedings December 1869, page 23). I am informed that the whole demarcation is now complete ; it only remains for the forest to be visited and for a distinct agreement to be drawn up as to the forest rights, if any, which are to be allowed in each tract. These tracts had the usual unfortunate status, *viz.*, the soil belongs to the people, consequently reproduction of forests is almost impossible. I hope this will be all arranged before I give over charge.

31. *Leased forests, Chumba.*—The allusion made to the new lease, and to the rules in the introduction, will explain what follows.

Progress in settling Chumba forests.

Already considerable progress has been made in the selection of forests.

The forest of Kalatope, near Dalhousie, has been "reserved" and has been surveyed ; demarcation is done and the pillars are being set up. As this was a forest in which neighbouring villages would have been prejudiced by absolute exclusion of grazing, &c., the forest has been carefully fenced in, leaving a good area for the limited exercise of forest rights outside the *fence* but within the boundary. The survey map has been circulated, on which is entered the line of fencing, and the portions in which forest rights may be exercised are colored green.

Kalatope.

32. Inside the fence no forest rights are allowed.

The blocks are—

1. Pindár Bani.
2. Oak hill (at present under operation).
3. Sárnee.
4. Jagrota.
5. Kalatope Proper.
6. Khajlota.

Outside the fence, the forest rights allowed are, grazing, cutting grass (when special passes are given), cutting necessary trees for building, &c., by permit of Forest Officer, and gathering dead wood. The whole system of selling standing trees has been put a stop to. We have opened a small timber depôt at Bathri Gullee, and supply indent in scantling and planks which we fell and saw up by our own establishment. Sawn deodars sells in the forests at one rupee a foot. The price should be raised next year for *long beams*, as one rupee hardly pays.

Kaintli.

33. The forest of Kaintli has also been reserved; it is some distance from Dalhousie, but may pay ultimately.

Buklo.

34. The forests around Buklo cantonments were visited first by Mr. Sparling and then by Mr. Righy (Assistant Conservator, lower Ravi,) and myself; we finally determined the reserves, and demarcation and fencing have been begun.

Reserves.

35. The reserves are—

Absolute or free of all rights.	I.	Bára, including Katásuí spur.
	II.	Kútla.
	III.	Chalána (near cantonment).
Open to grazing, but lopping, felling, &c., prohibited.	IV.	

36. My cordial acknowledgments are due to Colonel Reid, who has greatly facilitated and expedited the arrangements reported. Considerable progress has been made in surveying the forests on the Upper Chenab and on the Ravi. In the former a survey has been made and a temporary demarcation of all forests reserved. Directly this is reported for final confirmation under the rules, the permanent pillars will be put up. This it is hoped will be accomplished during the ensuing season. nI the latter division no demarcation has yet been done, but I hope this season will see good progress made. Meanwhile the very draft of the lease which has been agreed to, and the rules drawn up by me and agreed to in conference between the Commissioner of the Amritsar Division and Colonel Reid and myself, have been submitted for the approval of Government.

37. *Bussahir.*—I have no remarks to make. The question of the reservation of sacred groves, which requires careful handling, will, I hope, be disposed of this year. We have to guard against hurting really genuine feeling of the people on the one hand, and allowing the plea of a grove being "sacred" from becoming, like the "corban" of the Jews, a mere excuse for depriving Government of its rights under the lease. The Bussahir waif lease has been agreed to and its clauses are actually in operation, but there has been some delay in signing the formal documents, which, I hope, will be at an end before long.

Lease of forests near Simla.

38. Referring to the subject alluded to in para. 83 of last year's report, I have heard nothing further from the Commissioner of Amballa on the subject.

Section II.—Forest Rights.

39. I think it unnecessary to add anything to what I said in last year's report, in which the subject was discussed in detail. The extinction of obnoxious rights appears only to be possible in this country by the system reported above on the Hushyarpoor forests, *viz.*, of conceding certain tracts of open forests for the exercise of rights in exchange for a complete reservation of the remainder of the forest; for in nearly all cases it is not *money* that the people want, it is fodder, and the grazing without which the pastoral tribes could not subsist. In Kulu Mr. Duff has effected much improvement by drawing up a record of all rights allowed on each forest. Copies are in the hands of the protective establishment, and are also sent to the Assistant Commissioner of Kulu.

Bussahir, requirements of the people.

40. In Bussahir Major Batchelor reports that the arrangements as to rights of 1866 answer perfectly :—

"Forest rights remain unaltered, the first arrangements, *viz.*, those of 1866, being found to answer perfectly; the villagers are allowed to graze their cattle in all mature and original forests that have not been cut into. They are allowed on application to clear small and inferior patches of forest, 'other than deodar,'

for cultivation ; they are also given on application permits for trees for building purposes, which are granted from forests or patches of trees useless, from their situation, to Government ; the trees thus given away are marked off by Forest Ranger. No trees are thus given away from Government demarcated forests. During the season of 1870-71, the following were granted to the Zemindars of Bussahir :—

Deodar over four feet in girth	... ...	250 trees.
Do. under four feet in girth	... ...	540 ,,
Cheel under do. do.	... ...	135 ,,
Kail over do. do.	... ...	110 ,,
Do. under do. do.	... ...	1,704 ,,
Total	...	2,539 ,,

The number applied for by the Zemindars was over 5,000, but each applicant's demand is investigated and only his real wants supplied. The number granted may appear large, but when it is taken into consideration the material of which a house is made in Bussahir, *viz.*, 75 per cent. of wood to 25 per cent. of stone, the number granted will not be thought extravagant."

41. I have my doubts, however, that some definition like that adopted in Chumba will eventually be necessary.

42. In Chumba the system has continued for the year (I hope the last) of felling deodar for villages by permission of headmen. The system is now changed by the proposed rules, and only the unreserved forests are open to such a practice. It is impossible to check the headmen. It is commonly asserted that far more trees are felled than are reported, that saplings are cut, and that permits are passed from hand to hand. These matters are very difficult to prove. But villagers have admitted to me that such is the practice. There is little, however, to be gained by dwelling on the subject, as all such practices will at once cease with the introduction of the rules. Mr. Elliott writes : "The return is sent monthly to me by the Superintendent, of which the following is a summary :—

1 man for repairs of house, 3 trees	... ...	3
96 men for do. do., 96 ,,	... ...	96
87 do. do. do., 2 ,, each	... ...	174
For temples and Rajah's "Kotties," &c.	... ...	19
Total	...	292

I am not sure whether the return for the 12 months of the preceding year, *viz.*, 'Hindi, 45,' official,' 69-70, was forwarded to the Deputy Conservator's office or not. It was as follows :—

Deodar for Chumba Bridge	41*
Inhabitants, &c.	31
Making for the year a total of bridges	65
Rajah, temples and people	216
Total ...	281"

Section III.—Protection ; Forest Officers.

43. During the year the only officers who had magisterial powers were Mr. B. Browne and Major Batchelor. I take this opportunity of correcting a mistake made in para. 113 of last year's report. Magisterial powers are *personal* and not attached to an office, but are to be exercised only where the investing order allows ; *e. g.*, an officer invested on the Beás and transferred, cannot exercise his powers in the new Division, nor does his successor take up his powers on the Beás without himself being invested.

44. In the leased forests of Chamba and Bussahir it is absolutely necessary for the officers to have powers sufficient to punish offences against the rules. On the other rivers it is not so necessary.

Exception ; case of Chamba and Bussahir.

45. In the Fuel Reserve and Plantation Divisions the argument in favor is that it is necessary to provide a speedy mode of settling cases of trespass, petty mischief, &c., which ought not to be overlooked, and yet at the same time it would be a hardship to send a man several miles to a Magistrate, to say nothing of taking witnesses and protective forest officers, &c., from their forest work to give evidence. I think this fact is generally forgotten when it is objected on principle that forest officers should not have magisterial powers.

46. A few notes on forest offences, &c., may now be given, according to Divisions.

Jhelum Division.—The prevalent offence of firing the forest, &c., on the low hills has, I am glad to see, much abated, and this seems to be due to the vigor shewn in putting down these offences by Mr. Plowden, the Magistrate in charge of the Murree Sub-Division. Eight cases were brought to justice, and compensation to the amount of Rs. 1,498 levied under Rule 9 of the Forest Rules of 1855. 51 cases of theft were tried, of which, however, 21 were lost, shewing how difficult it is to prove cases of wood pilfering, and how essential it is that rules should aim at preventing the possibility of theft, rather than punishing it when accomplished.

47. *Upper Chenab.*—The forests of Pangi occurring in thinly peopled and inaccessible glens, forest offences are very rare. The great scourge of the place consists in the herds of cattle and goats brought by "Guddees." They wander all over the place, trampling down seedlings, and though the small cattle do not eat conifers, they bite off the shoots. The Guddees also leave smouldering camp fires, which, fanned by the breeze, sometimes result in conflagrations.

The present arrangement for the demarcation of forests will, I hope, succeed in checking this evil.

48. *Upper Ravi.*—There is great difficulty in bringing offenders to justice, because the officer in charge has not any powers ; but as soon as the rules are published, he should be invested. The offences reported to, and punished by the Superintendent of the Chamba State were several cases of illicit felling of standing trees.

49. *Beas.*—Cattle pounds have been established at Pandhain in the Hushyarpoor district, and Tallara in Kangra. The whole question of cattle pounds is now set at rest. All cattle pounds are under the Magistrate of the District, and it requires no special magisterial power in a Zemindar or holder of land or forest officer to seize cattle trespassing ; an erroneous idea to the contrary seemed to have been entertained by some officers. I have circulated copies of the Cattle Trespass Act to all Forest Officers likely to require them.

The only other offences reported in the division are thefts of timber in transit. 30 cases of theft have been tried, and Rs. 342 levied in fines.

50. I hope that the present discussion of waif rights on the Sutlej will have the effect of settling the rights of Mandi State, also on the Beás. It is not only the right of waif and what waif is that is disputed, but what I deny most emphatically is the right of the Rajahs to send out men into the water, and I contend that their territory ends with the land, and that they have no right to interfere with the water-way, or with anything but what is actually washed up or left on their shores.

A fire occurred in the Karupúr Bamboo forest, but was promptly extinguished and no damage was done.

System of report of forest offences.

51. Mr. Duff describes his system of reporting forest offences thus—

"Each officer in charge of a detached block keeps two books, with six headings, one for reporting thefts or damage done to Government timber in the river or forest, the other for reporting irregularities on the part of subordinates immediately under him.

"On a case being reported to an officer, he enters the particulars in his books, and sends the *original* report to me for orders. There is a column in each book in which the orders passed are entered."

52. *Lower Chenab.*—A fire occurred at Aknoor, resulting in the destruction of 400 logs belonging to Mean Mahomed Sooltan, but no Government logs were destroyed; 36 cases of theft were brought to light concerning 86 logs; 45 logs have been recovered and fines to the amount of Rs. 435 levied.

53. *Lower Ravi.*—A few small theft cases were punished. The officer in charge complains that theft cases of timber are generally disposed of by Subordinate Magistrates, and punished with such trifling penalties that the deterrent effect is slight.

The difficulty of detection is very great, and the damage done considerable; when cases, therefore, are caught, they ought to be severely dealt with as a warning.

Sales by Kashmir authorities notified.

54. A system has been adopted whereby the Kashmir authorities give notice whenever they sell timber, &c., on the river. Our own practice since the issue of the sale and depôt rules is to sell *nowhere* but at a sale depôt; but the Kashmir people sell timber on the river, and if no notice is given, every man who is found with suspicious timber has the excuse ready that it was bought on the Kashmir side.

55. *Plantation Division.*—No offences worthy of notice are reported; cattle pounds have been established during the year at all the principal plantations in the province.

56. *Fuel Reserve Division.*—It is a matter of congratulation that at present mischief and trespass are by no means common. Boundary encroachments are not uncommon. The frequent use of kucha or mud pillars for village boundaries enables villagers to push them back by degrees. I recently detected a serious case in the new valuable Keekranwalli Rukh, close to Goojranwalla, and a full enquiry has been made which will result in our recovering a considerable area. The case is not yet decided, but will be very shortly.* The new establishment once finally disposed, it will become a rule that every forester and forest watcher has special charge of certain boundaries, has to visit them all once or twice, as the case may be, in each month, and submit a report of the state of each pillar or mark. This system will be introduced into every division without exception.

* It has since been decided, and the correct bounds are now about to be laid down, with a trench and double hedge which will defy future attempts of the kind.

Section IV.—Management and Improvement.

57. I propose to treat this subject by the Forest Divisions.

58. *Jhelum Surveys.*—Arrangements were made to start the survey and demarcation of the Hazara Forests. The history of that Survey will belong to the next report.

Division line.—During the year, I arranged with the officer in charge a complete scheme for apportioning the division into sub-divisions, ranges and beats, and this will be seen in the recent establishment report submitted with my No. 153, dated 11th May 1871, comprising the working of the river, the district of Rawulpindee, the forests at Murree and beyond in those parts of Hazara comprising the Murree, Dungagalli and Mochpore ranges, the Thandiani range, the Balakot hills and those of the Kaghan valley. The division has been sub divided into—

I.—Sub-division Lower Jhelum or Ravi.

II.—	Do.	Rawulpindee ...	Range Murree and Kahuta. Range Rawulpindee.
III.—	Do.	Upper Jhelum,	Range Dungagalli. Range Siran. Range Kaghan.

I regret to say we have nothing like a working plan of these forests. Hitherto work has only been done in Kaghan, which is the only range actually in our working charge, and the operations have been restricted to felling as few trees as possible, and to making some experiments on a small scale in deodar planting. But the time of transfer of the other forests having now come, it is clear that a working plan ought to be prepared.

58A. No plantation work could be undertaken in the year; but a thorough clearing out of the Malkandi Forest preparatory to planting was made.

59. *Upper Chenab.*—Topographical surveys of nearly all the forests have been completed from Darás to Tindi, and during the year the valley has been divided into five ranges, corresponding with the local sub-districts, and an establishment proposed.

Conservator's visit.

60. I visited this valley in 1870, and was much pleased with the state in which I found it. The road partly made by this department in 1867 as far as Tisa, is certainly very badly laid out, but the roads in Pangi itself and the bridges are excellent. The high level wooden bridge at the half-way house near the top forest exhibits considerable ingenuity, especially in preparing the road on the opposite side, which must have required blasting operations of no ordinary difficulty; this work was carried out by Mr. Sparling.

61. The improved "jhúla" or suspension bridge below Kilár still stands, and ponies can cross it. The ropes have been retained, and the netting, destroyed by monkeys in the cold season, renewed. The road from Kilár onward is excellent for about four miles, when the construction being taken out of the hands of this department (why, I do not know), the rest is by no means satisfactory. An excellent path has also been made on the left bank from just opposite the point where the Sach nulla runs into the Chenab. I hope we shall improve some of our bridges shortly. I crossed, with difficulty I confess, a "jhúla" at Bawal, and 12 hours afterwards the whole affair was carried away without a trace of its existence being left. A "jhúla" bridge at Shor also is on the highway; it is exceedingly disagreeable to contemplate.

62. A forest house and granary at Kilár has been contemplated. The granary is capable of holding 600 maunds of grain, all of which was to be imported for the supply of working parties. By an ingenious arrangement of boarding, the granary has been rendered impervious to rats.

63. During the tour I devoted my attention particularly to the subject of the restoration of the deodar forest. In many localities natural reproduction is excellent, but in others the primeval forest is situated on such steep inclines and in places where launching is so difficult that there seems far greater hope in planting new sites where the slope is easier. I hope ere long to submit a separate note on this subject, having been hitherto delayed by more pressing cases.

Plantations

64. I visited the plantations at Agog and Purti, which are instructive. Mr. Sparling reports as follows:—

Management and improvement

"The experimental plantations of Purtie, Agog and Chow on the whole are very satisfactory—the three taken together, the result of failures on the 1st October scarcely come up to 6 per cent, the greatest percentage being on the Purtie one, from the sandy nature of the soil and from its being under the direct rays of the sun and completely without the shade, moisture evaporates quickly and leaves the young plants without nourishment. The trees in these plantations were planted 10 feet apart each way, but it is proposed to interplant them next year, which will leave them 5 feet apart, for this purpose a lot of seed has been sown in favorable places in drills some 10 inches apart, besides a large plot has been cleared on the Chow Pill, which it is proposed to plant during the next season at 3 feet apart each way, this distance assimilating more the natural conditions of production."

65. From observation of these plantations it seems clear that it is necessary to imitate nature in our plantations, both as to times of sowing and conditions of growth, and that deodar will not succeed in perfectly open plantations, above all not if the plants are at any distance apart. It is quite a mistake to clear brushwood away. Rank jungle which clogs the young trees *close to the ground* and upwards is objectionable (and its growth, as at Chow, is facilitated by the removal of brushwood), but a cover of brushwood which has a *clear distance of stems or stalks near the ground* and shade overhead is desirable, and I believe young deodar seedlings put in under a cover of the *Indigofera Vibarnum*, or better still under a low oak coppice, will succeed better than anywhere else. Ten feet apart especially in open plantations is too far, 4½ feet is plenty, and it would be well to intermix *P. excelsa*.

The most successful treatment is by planting out of natural beds of seedlings in the forests or artificial nurseries at the second season. It does not do to transplant deodar above 4 inches high; they may succeed, but it is dangerous.

Clearing rivers.

66. As regards blasting and clearing, some rocks have been blown out of the Sach tributary.

67. *Lower Chenab.*—There was some blasting of rocks to be done near Aknoor, but the press of work at depôt prevented its being undertaken during the year.

68. *Upper Ravi Survey.*—A portion of the forest on the south of the river has been surveyed, but demarcation has not yet been made.

69. *Division Line.*—For the purpose of determining the charge of forest officials, the whole river forests have been distributed into two ranges, eastern and western. The first comprises 8 beats, from Bárabangál to Chumba and Bátri. The second contains Chánjoo and Tisa and the Bhándal district, comprising 5 more beats. I believe that ultimately it will be admissible to place a second European officer on the river for the western range.

70. *Improvement.*—It is impossible to carry out much work in improving forests till the demarcation and selection is completed, but 2 promising tracts of deodar at Harsa on the Budil river have been thinned and fenced, &c., generally in clearing out logs of former fellings from the forest.

71. About 30 miles of the road from Chumba to Barmaur has been repaired and improved, 4 miles of new road made from Burmaur to Lámú, and 12 miles of new road from the Kalel bridge on the Pangi road has been joined on to the old one.

72. Two new slides have been made, and the large slide at Lámú improved.

73. *Plantations.*—Mr. Elliott writes: " About 3 acres of ground at Lámu are now planted out with young deodar, of which 2 acres are from seed sown in the nursery in October 1869, about 2 acres more have been sown with seed rather thickly, so that there will be sufficient seedlings probably to plant out 50 acres. A great many young trees are killed yearly by grubs. I hope to send a specimen to the Lahore museum when I return to Burmaur. It attacks the roots and kills the plants by eating off the back."

"I have neverseen a plant of over four years of age so attacked. The nursery at Barmaur has been abandoned, as the young deodar did not thrive there. I purposely began on a small scale as an experiment, being anxious to raise some deodar near the village of Barmour, as there is none within four miles either up or down stream. I have not been able to discover the reason of the failure."

Trade in timber.

74. This year has seen the last of the logs belonging to private traders—211, of which the last remaining were cleared out.

75. I am very glad that the Sind traders' logs are all cleared out from the main forests. The system was a precarious one, and we had to recover the costs incurred in launching by detaining the logs when they reached depôt.

76. During the year the whole of the felled timber still lying in the forests belonging to Mahomed Sultan, contractor, which was under our orders, being gradually worked out by Government agency (the costs being charged against the timber on arrival at depôt) was sold by the Chumba court in satisfaction of a decree against Sultan ; as a measure of self-defence, it was with the sanction of Government bought for the State at a cost of Rs. 23,000. This large outlay is against the results of the year, but will be realized in future years. A precise estimate of the number of the logs has been called for.

77. A forest house at Barmaur has been completed, and that at Chumba repaired, and servants' houses added.

78. *Lower Ravee.*—I have already at para. 32 indicated what has been done at Kalatope. The fencing line was partly completed, and will be entirely so in a month or two.

Our English trained planters have been located in Kalatope, and have commenced work ; each separate block will be taken up *seriatim.* That called "Oak hill" forest has been begun. All stumps and rotten logs are to be cleared out, all broken trees and those which are dying and likely to fall are to be removed, and reproduction over the whole equalized by transplanting natural seedlings, which, as usual, under such conditions, are naturally dense in some parts and sparse in others.

79. Throughout the forest within the fence the plots of cultivation have, with Colonel Reid's consent, been measured up, and compensation is about to be made. These cleared or partly worked lands will in many cases make convenient sites for nurseries. A small forest house of timber, slated, has been erected, also a timber shed. All contractors have been ejected, and the trees felled and sawn up by direct agency. Sales for cash are effected at the shed or depot outside the forest.

Cultivation bought out.

Forest house and shed.

80. Fencing has been commenced in the Baklo *cheel* forests, and a plot of partly cleared land in the Kuntla forest—5 acres will be treated with Tun, hill Eucalyptus and lance-wood *(Grewia)* as an experimental measure.

Baklo forests

81. *Beas Division lines.*—The division has been divided for protection and working purposes into, (1) Upper Beas range, including Kúlú and part of river under direct charge of the Divisional officer ; (2) Hushyarpore range, divided into two sub-ranges, the Bamboo sub-range and the Lohára sub-range, each under a native Forest Ranger ; the River and Depôt range under Mr. Mackay, Forest Ranger, 2nd grade.

82. *Plan of operations.*—A preliminary sketch from a working plan of the Beas forests, prepared by Mr. Ribbentrop in 1869, has been further improved and brought out ; it has been printed and circulated, however, after the year under report closed.

83. *Improvements.*—A forest house has been built in Kúlú, at Monáte, at a cost of Rs. 1,470, and a small one at the Nadaon depôt. Huts for Moonshees, &c., have been put up at Nadaon and Dôdá, and those at Nowshera and Pandain repaired.

84. A slide 30 feet wide has been made from the north side of the Dúrgiri forest, and another from the top of the river bank in front of the Phúlga forest.

85. *Plantations.*—Mr. Duff reports as follows :—

" Creepers and thorns were cut and used in repairing fences.

" 14,337 seedlings were brought from a distance of about five miles to fill up vacancies. These were planted in funnel-shaped holes, 20 inches deep by 16 inches wide at the top.

" Notwithstanding the care that was taken in planting out, I should say that 50 per cent. only will come to anything.

" The plants have done well in the vicinity of old deodar trees, but where the land has been denuded of trees the casualties are great.

" Nature does not appear to replace the deodar with any other forest tree, as is the case with the pine and birch in Britain.

" Here the wild indigo springs up in dense masses in any cleared space of a deodar forest.

" Of the deodar seed sown last spring about one-fifth germinated, and of these seedlings about half are alive now, *i. e.*, one-tenth of the entire sowing.

" I tried four different aspects and soils. The only nurseries that have done at all well are two, partly under the shade of deodar trees. All four nurseries were treated alike.

" They were protected from the hot sun by the hurdles, and were regularly watered.

" Apart from the natural difficulties we have to contend with in the reproduction of deodar forests, the situation of some of the forests in Kúlú is much against successful planting.

" The particular forests to which I now allude are Seâl Behâl, Dána Behâl, Munâlgun and Doongree. The main road runs through the first three forests, and the last named is on the edge of a village.

" It will be necessary to go to some expense and pains before these forests can have any chance of being re-stocked.

" Timber fences have been tried fairly and utterly failed—nothing but wire fencing will do ; and instead of planting out large areas at a time, we must be

content to have small areas well planted, and where the land has been denuded of old trees, we must protect the young plants artificially.

86. It is not stated what size the seedlings were which were transplanted, but they were probably too large when they failed extensively. In a place like this, I would never use for transplanting any but quite small seedlings, and always put in *P. excelsa* freely with the deodar either in alternate rows or holes. It is probable that seedlings would come up under cover of the Indigofera if it was not let to grow *too* thick.

87. *Sutlej.*—A complete division of the upper and lower river (including the Kolesar forest) has been made so as to distribute the protective and executive work into convenient sized charges.

88. A preliminary plan of operations is in existence, and some other valuable papers on these forests, all of which are materials towards making a more complete working plan, have been placed at my disposal by Mr. Brandis before he left India.

89. *Improvements.*—The forest road (three feet wide) of 6 miles from Waugtu bridge to Jeti, along the Warga, has been completed, and two wooden bridges were put up across the Warga stream ; another road from Waugtu bridge to opposite Rampur on the left bank of the Sutlej is nearly completed ; it is a footpath three feet broad, and between 80 and 100 miles in length ; only 15 miles remain ; the cost of making was only Rs. 30 a mile. This path will render the forests on the left bank accessible.

90. The "saugra" or wooden bridge across the Sutlej at Shalto has been furnished at a cost of Rs. 2,250.

During the season the forest of Koorakoone was thinned out according to Dr. Brandis' suggestion.

91. The forest slide of western Náchár has been completely set in order, and a new slide 600 feet is being made at the top of the forest. 500 mines were exploded in the blasting operations for these slides.

91*a*. No new plantations have been made, but those at Shalto and Náchár are both fenced in and doing well.

92. *Fuel Reserve Division.*—The transfer has only just been completed ; it is therefore too early a stage in our management of these "rukhs" or woodlands to have much to detail. Registers are being prepared and maps for each district. All this is detailed in Appendix A. The operations for reproduction (which is almost always by coppice) are effected simply by closing the cleared tracts carefully against grazing. Several rukhs on the verge of rivers have been made over to the plantation division for treatment.

93. *Plantation Division.*—I have obtained the sanction of Government to this name ; previously it had the lengthier title of "Fuel Plantation" Division. Besides its length, it was not a strictly correct name, as our plantations are by no means confined to the production of fuel.

94. I shall not go into any length on the subject, but print as Appendix B. Mr. Ribbentrop's excellent report.

Reasons for placing Mr. Ribbentrop in charge

95. I have only to observe that during the year this officer took charge of the division owing to the fact that Mr. Amery, the officer previously in charge, was the only officer in the province fully competent to take up the important duties of organizing and conducting the newly-established Account Office. Other officers had indeed been mentioned for the post, but I found that they had not the necessary knowledge or qualifications and were better at other work.

Canal questions settled.

96. I am glad also to report that the system of canal water-supply, as regards rates and method of adjustment, have been placed on an thoroughly satisfactory basis. An uniform rate of Rs. 1 8 per season is to be charged, but land let out to cultivators is to be assessed as usual. The area to be paid for will in future be ascertained by the plan of operations at the beginning of the year, and the necessary sum transferred by one payment. By this method all disputes about measurement, nature of cultivation and number of waterings will be avoided.

97. During the year a fine masonry water-head at Gundian, and a branch, mostly of raised earthwork, has been completed, at a cost of Rs. 10,000, for the Chunga Munga Plantation. This work will enable us to water a large area in a very short time, which is the point that is so pre-eminently desirable.

98. A forest house has been completed at Chunga Munga.

99. The plantations were inspected in the winter by Mr. Brandis, Inspector-General, and in several excursions Mr. Schlich and Mr. Fenner of Sindh accompanied us, and a number of the junior officers of the department.

100. Several of the small and outlying plantations, as Muloâhu, Souâki, Khânwa and Sarungwâl, have been left alone.

101. The state of the plantations of Sera and Rodeshah has been the subject of much anxiety. The enormous outlay on these places cannot be expected to yield a return, and it was deemed desirable to let them take their chance and spend no more on them. The Inspector-General entirely concurred in this view.

Faults in work to be avoided.

The only thing to do with this is now to treat them on what we called the "Improved Rakh" system described by Mr. Ribbentrop. It must be borne in mind, above all things, that numerous small scattered plantations never can pay, they cannot be supervised, they cannot be made to fall in with any system of working.

Repeated trials on the same ground.

102. It must also be borne in mind that there must be no such thing as going over and over again trying to plant and sow the same ground; the rule should be, whatever blanks can be repaired in the year, repair, but not after without special sanction. Lastly, works *must* be concentrated on a few places.

103. The only unsatisfactory feature about the work is the want of a *large* plantation for the Delhie line (Amritsar to Delhie), and this question is still unsolved. A large area of land at Delhie, but in the North-Western Provinces side, has been visited and reported on, and the question of utilizing it referred to the North-Western Provinces Government.

104. The question is full of difficulty, for I am by no means satisfied that there is not in the Dehra Doon and elsewhere an as yet unknown source of supply; with merely 200 acres here and 200 there, we cannot do anything satisfactory.

105. As regards our existing plantations, we have hardly effected anything for a supply of the line. For though I may refer to the plantations of Jullundhur, Philor and Loodiana, roughly aggregating 480 acres, as fairly complete, they are little more than wayside groves, capable of meeting a small local demand. I invite special attention on this head to Mr. Ribbentrop's remarks in para. 123 of his report.

106. For the Northern (State) Railway, a commencement has been made in planting at Lahore and Wuzirabad on sailaba land. A report has been submitted with a view to other lands being taken up. On this orders have not yet been issued (my No. 81, dated 14th April 1871).

Section V.

Yield and working of the Forests.

107. I propose to treat this section in the following order :—*(a)* Forest work, or operations in launching and felling timber and wind-fall; *(b)* Depôt work, or sales, and outturn at Depôts; *(c)* produce of special tracts, as Kalesar and the bamboo jungles in the Beas Division.

Principle on which the fellings were directed.

108. *(a).—Forest work.*—On those rivers where we had even the sketch of a working plan the amount of timber that could be cut was known. On the Chenab, Ravee and Jhelum (Kaghan Valley), where such information does not exist, it was determined to fell as little as possible, consistent, however, with the urgent necessity for supplying the Northern (State) Railway demand. Although, as regards this latter, we had the Kashmír contractors to fall back on, yet the prices demanded by them were so very high that to have relied on them altogether would have caused a heavy loss.

109. But it became very early evident that the most important feature in any proper forest work for the next few years would be the introduction into the market of considerable quantities of *conifers* other than deodar, accompanied by a considerable increase in the price of deodar, so as to compel the saving of the deodar and the utilization of the pines. There are two points to be borne in mind on this head, one of which at least it is impossible to gainsay. The fact is that these pines have been generally far too hastily condemned. I have heard this view controverted, and the results of actual experiment have been appealed to. But all those experiments, however carefully made, are open to the objection that they have not been made on a sufficiently large scale, or in a sufficient variety of climate ; *e.g.*, one officer's experience of *chil* wood is that in buildings it rots ; that, used in Kangra for the centering of bridges, it lasts hardly to the second season ; but, in the first place, *non constat*, that in a climate with a less rainfall, and on perfectly drained ballast, in the form of sleepers, it would do the same. And certainly *chil* has been used at Buklo, the whole cantonment being built with it, and has (notwithstanding that it was used green and unseasoned, and from small-sized trees) stood fairly well. Kangra *chil*, which does not last in the moist climate there, has had for years a good reputation for house-building at Lahore. The second point is that no one doubts these pines will do for indoor work, for boxes, cupboards, and many other purposes for which deodar is too often used. It is simply waste to use deodar for a packing case; and I believe that, if it were made a rule that for all office "almirahs," racks, tables and forms, Dáwk Bungalow and Road Bungalow furniture, &c., deodar was not to be used, the saving to Government would be considerable.

Introduction of other pines.

Reasons for using pines.

110. It will probably be wise for Railway purposes to impregnate such pines.

But should be impregnated for sleepers.

111. With a view of carrying out these objects, all the rivers had orders to cut the pines more than the deodar.

Fellings in 1870-71.

Thus for the year 1869-70 and 1870-71 (during the supply for the Railway) the trees felled (which were *within* the number proposed on all occasions) were—

Rivers.	*Deodar.*		*P. Excelsa.*		*A. Smithiana.*		*P. Longifolia*		Remarks.
	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	1869-70.	1870-71.	
Jhelum ...	1,113, a number being dead trees.	666	666	579	...	...	1,523		
Chenab ...	797	976	...	900	2,211				
Ravee ...	155	500	...	1,000	...	...	...	10,446	Special felling noted below.
Beas ...	432	150							
Sutlej ...	237		...						

The rivers Beas and Sutlej not being then concerned in the Railway supply, the felling of pines was not thought of so much importance.

112. The numbers of deodar are certainly higher than I liked ; but against this it will be remembered that for 1871-72 on two rivers no deodar, only *dead* trees in Kághán, and 60 trees according to the Beas working plan, will be felled.

113. The two large items of felling of pines are 2,211 trees of *A. Smithiana*, felled on the Chenab in 1869 (mostly received in Depôt in 1870), and 10,046

P. Longifolia, noted in the Ravee column, but felled under Mr. B. Browne, partly in the Gurdáspore *chíl* forest, with transport by the Ravee, and partly by the Beas.

Felling of A. Smithiana.

114. On the first I submitted a report in my No. 482, dated 1st September 1870.

There were 11,500 logs put into the river, and of those received in 1870 in Depôt (about 5,528 logs ; but this includes a few *P. Excelsa*, which unfortunately got confused with them) the sales realised from eight annas to five annas a foot, or higher than the rate estimated by me. This wood has been extensively used in temporary works by the State Railway, and even 500 sleepers put down as an experiment.

Experiment on a large scale necessary.

115. It is necessary in introducing pines like this to do so on a fairly large scale, where there is no risk of absolute loss. Results obtained with merely 500 logs or so are insufficient. I shall not consider the full price reached for this timber till several more auctions have been held.

Felling of *Pinus Longifolia.*

116. The large felling of *Pinus Longifolia* was commenced partly under a mistake, but is not to be regretted.

117. It was orginally designed to supply 50,000 double sleepers to the State Railway, and that the proposal appeared to be received so very favorably that I started the work. In fact, I distinctly understood that the offer was accepted; that, knowing the urgent nature of the orders about the timber-supply, I thought myself justified in losing no time and beginning at once.

118. It was afterwards, however, decided that 15,000 single sleepers only could be taken, and arrangements were therefore made for bringing down the rest of the timber which had been felled (but not converted) in the shape of beams, kurries, &c., most of which will arrive at Wuzeerbholar (on the Beas) during the year, and will command a ready sale.* No loss will therefore occur in this matter ; but the contract has at present an unfortunate appearance in the account sheet, as from the season of flood, &c., it was not possible that any large quantity of timber should have arrived and been sold before the year closed ; consequently only the charges paid in advance appear in the account.

Sleepers should be impregnated.

119. I hope that when even so small a consignment as 15,000 sleepers is taken by the Railway, they will be impregnated ; for I do not hope that *Chíl* sleepers will answer well on other conditions. It is probable that the beams will for indoor work answer well.

120. I have dwelt at length on this question because I feel clearly that the utilization of the hitherto misnamed 'Inferior Pines' is *the* economic forest question of the day.

Price of deodar.

121. Deodar may be priced higher yet, and I have great satisfaction in being able to add that people are beginning to say that deodar is expensive. As long, however, as it can be used for packing cases, it certainly has *not* attained its full price in the market.

Deodar felling compared with estimated stock.

122. It may not be uninteresting to add a table of the number of trees cut on the various rivers since the date when the number of first class (mature) *C. Deodara* trees was estimated.

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* NOTE.—The fellings were thus arranged :—

Gurdaspore District.	
Dhalladár forest	... 1,297
Nagh Dhár	... 500
Karnál Dhár	... 278
Dhár (Khurd)	.. 1,192
Dhár (Kalán)	.. 120
Kangra District.	
Tattal	... 4,942
Oondi	... 497
Haral	... 316
Saryáli	... 904
Total	... 10,046

River.	Estimated number of 1st class trees.	Felled in 1866.	Felled in 1867.	Felled in 1868.	Felled in 1869.	Felled in 1870.	Total.
Jhelum (Kaghan)...	Estimate in 1867, Mr. Ribbentrop, 10,000 or 15,000, including trees difficult of working.	...	500	350	1,113	666	2,629
Chenab ...	Dr. Stewart, 1866, 16,990, including those difficult to get out.	4,000	1,002	...	797	976	6,775
Ravee ...	Dr. Stewart, 1866, 12,425, do. do.	18	...	...	155	500	673
Beas ...	Estimated in 1865, Mr. Stewart, 10,000	792	120	397	432	150	1,891
Sutlej ...	Over 48,000, Report of 1864.	250	167	208	237	...	862

123. The results of logging and launching may now be given in a tabular form :—

River.	Kind of wood.	Total logs in forest.	Launched in 1870.	In forest at close of season.	Remarks.
JHELUM ...	Deodar ...	3,913	2,222	1,691	
	Excelsa ...	4,442	1,859	2,583	
	Smithiana...	...	...	...	
	Longifolia...	4,464	4,323	141	
	Wind-fall ...	5,072	4,604	468	Mostly deodar.
CHENAB ...	Deodar ...	7,258	7,258	...	
	Excelsa ...	5,600	5,600	...	
	Smithiana...	...	...	...	
	Wind-fall ...	14,156	13,560	596	Do.
RAVI ...	Deodar ...	5,380 also 37 unlogged trees.	4,455	925	
	Excelsa ...	4,333, also 171 unlogged trees.	3,730	600	
	Smithiana...	...	...	...	
	Wind-fall ...	D. 7,256 E. 785 Sm. 715	8,756	...	Also 1,535 sleepers sawn and launched.
BIAS ...	Deodar ...	5,760	3,314	2,446	
	Excelsa ...	...	...	...	
	Wind-fall ...	...	...	...	
SUTLEJ ...	Deodar ...	1,302	432	870	These were also launched. 744 logs of toon (confiscated.)
	Excelsa ...	...	...	...	
	Wind-fall ...	5,478	5,478	...	

124. Much of the uncertainty about depôt receipts that has hitherto been felt was owing to the absence of the date being cut into the logs. Every log launched during this year has been dated, and all pines other than deodar are marked with the initial letter, as L. (for Longifolia), P. E. for Excelsa, A. S. for Smithiana, &c. This has been adopted in order to do away with the practice (which could not now be allowed) of clubbing together, at the selling depôt, all conifers other than deodar and selling them at an uniform rate under the general designation of 'inferior pines.' Two or three years will, I hope, see the depôt entirely free of this conglomerated item.

125. Cross-sawing is everywhere adopted for deodar, but in felling the pines the looser texture and more stringy nature of the wood is said to make the use of the saw difficult.

Cross-saws.

126. Marking is generally done by a deep cut with the chisel; branding is very apt to wash out and wear out by rock friction.

Marking.

127. I regret to say that in my instructions I omitted to call on officers for a return of the percentage of breakages in launching down each slide in use during the season. This should be included in the report next year, and will give useful data for estimating the general loss incurred in this way.

(b.) Work at Depôts and on the River.

128. The procedure need hardly be described. Logs that have been launched from the forest are left to take their chance in the torrent till they reach a portion of the river where it begins to be more gentle in flow; they are then caught and formed into rafts and taken down by swimmers upon skins or raftsmen, as the nature of the locality admits, to the final sale depôt.

System of floating.

129. As logs are not always caught at the first place of catching, numerous 'transit' or 'working' depôts are established, and logs that pass one are caught at the next, and so on. The river "beats" or protective charges are usually divided from one such depôt to another.

Catching Depôt.

130. It is the exclusive right of catching by Government employés that is absolutely necessary to ensure correct accounts. For when the rivers pass through Native States, persons are sent out to catch timber, and these can and do freely land logs that are Government property, and cut the marks off them or detain them in spite of the cross-saw mark which at once proves them to belong to Government.

Right of water-way.

131. If a complete register of logs thrown into the river is kept, it is clear that, at any rate in theory, a correct stock account can be kept up; or, in other words, giving the number of logs in the forest at a given date, also the number of logs in the river, these added to the finally booked stock of the sale depôts give the total stock of logs. This stock is liable to be *diminished* by river theft, by breakages against rocks, and by abrasion of marks resulting in the timber being seized as waif; it is liable to be *increased* by the adventitious arrival of timber launched by wind or avalanches.

Register of logs.

132. By a strict definition of waif rights, or, better still, by buying out those rights altogether, we reduce the first and third to a trifling item; by blasting and clearing operations we ought to be able to diminish the second.

133. To have a complete stock account we ought to add the standing timber in the forests, diminished by fellings and natural or accidental destruction by wind, now or fire, and increased by the annual growth of material. At present we cannot attain to this. But there is no reason why the other should not be accomplished, and its errors eliminated by a periodical re-examination of the river. Hitherto the only stock account of timber has been that of the depôts.

Stock account.

134. I have therefore directed that a complete counting of logs in transit and in the water, or temporarily stranded, should be made. But of this more will be said in the 'financial portion' of this report.

To work with this system a complete registration of logs cut up and launched in the forest must be arranged. A report on this subject was submitted at our Forest Conference of 1870, but some difference has been elicited, and it will now remain to organize such a system with the utmost simplicity that it will admit of, and introduce it authoritatively on all rivers from the commencement of next season.

135. The "sale and depôt" rules have worked well, especially when the classification of deodar originally prescribed by Rule 7 was abandoned. The definition of 1st class timber was stricter than the style of timber ordinarily yielded by the rivers would bear, and its alteration has been sanctioned.

Sale and Depôt rules.

136. Sales for cash are everywhere the rule, except in a few special cases, where by special sanction of the Conservator, credit for limited periods and on good security has been allowed to unexceptionable purchasers: the rule that no debtor to the department (from previous transactions) can be a purchaser has been adhered to.

Sales for cash.

137. Sales and issue of timber are strictly confined to the sale depôts, and there can be no doubt that much evil results from the practice of selling logs here and there in islands, &c., on the river. Special arrangements are made for the sale of timber stranded too high to be floated off without great expense. The management of this by District Officers has been the subject of especial reference to Government.

Locality of sale.

138. The principal market for our timber has been the Northern State Railway for the three rivers, Chenab, Ravi and Jhelum.

Market.

139. On the Beas and Sutlej there was little or no demand for timber. The latter river especially was perfectly glutted by the quantity of surplus timber belonging to Messrs. Brassey and Co. It may, however, be recorded that the whole stock of the Beas and Sutlej has been now cleared off, though too late to be included in the returns of this official year.

Beas and Sutlej stock demand.

140. The other rivers shew also a large stock in hand at the close of the year. In this I am in no way responsible. The stock was collected for the State Railway, and it was left on the ground for many months: this was partly owing to the discovery that the timber was in a variety of lengths, and some of them wasteful for sleepers. It would be entirely out of place in an annual report to do more than state that this was the cause of delay. I have separately explained the subject in my No. 24, of April 6th, 1871. It was not till the end of the year that, after a conference between the Secretary in the Railway Branch, the Inspector-General and myself, a scheme for clearing off the stock was issued. I am glad to say that the Railway Officers, when once the scheme was issued, co-operated heartily in clearing the depôts, as the returns will shew, but still a good quantity was left in hand: this has a tendency to shew a cash deficit in the account, which, if the stock in hand is converted into cash, at once disappears.

Stock on rivers.

141. Still more unfortunate has been the circumstance that during the whole year the large amount of 1,09,365 cubic feet of deodar timber have been lying at the Noushera Depôt (Indus). This timber was ordered to be purchased for the Indus Valley Railway, and representation has been made on the subject; there is, therefore, an amount of about Rs. 90,000 outstanding. I venture to express a hope that in passing orders on this report this circumstance may be borne in mind, as I must submit that I have no responsibility for this outlay.

Case of Indus timber.

142. The transactions of the Northern (State) Railway may be exhibited in the following tabular forms:—

Northern (State) Railway transactions shewn in three tables.

The first shews the amount of money expended in purchasing timber from the Kashmír Contractors and the quantities of timber obtained from this source.

143. The Kashmír prices were high at first, but have been reduced lately, as I considered myself justified in representing to the proprietors that, having carefully avoided my obligation to accept any particular quantity of timber,* unless they were prepared to let me have timber at easier and fairer terms, I should advise Government not to use the timber. They were most of them reasonable, and fair rates are now in force, so as to enable me to offer the (State) Railway timber (deodar "serviceable") at 7 *feet* to 12 *feet*, 12 annas, and then one anna per foot more according to length up to 26 *feet*, when the increase is by 2 annas per foot in length.

Kashmír prices.

144. The next table shews the quantities of timber delivered during the year in logs and cubic feet, sleepers and "kurries" being included with the logs. To make this table complete the figures from the date of commencement of operations, October 1869, up to March 1871, are given also.

The 2nd table.

145. The third table exhibits the quantity of fuel supplied by the Fuel Reserve Division to the Railway works.

3rd Table. Fuel supply.

* All the perwanas issued shew this: we enquired indeed the total quantity that could be supplied if needed, but expressed that the quantity taken would be according to the Railway requirements.

TABLE No. I.

Statement of Timber purchased for the Northern (State) Railway in 1870-71, *or from commencement of works in October* 1869.

Month.	Jhelum.				Chenab.			Ravee.			Remarks.
	Timber.	Logs.	Cubic feet.	Price.	Logs.	Cubic feet.	Price.	Logs.	Cubic feet.	Price.	
				Rs. A. P.						Rs. A. P.	
October 1869 to end of 1869-70.	Deodar ...	3,567	1,09,003	1,04,860 10 0	4,106	95,747	1,01,275 0 0	6,814	55,646	69,225 2 7	Mostly deodar.
	Pines ...		...	...	...	...	...	...	...	...	Ravi includes 5,719 sleepers.
April ...	Deodar ...	247	6,807	5,967 2 0	656	20,923	21,691 11 0				
	Pines										
May ...	Deodar ...	...	...	...	412	11,048	11,061 2 0				
	Pines										
June ...	Deodar ...	...	...	...	307	6,768	6,591 10 0	5,774 (56)	...	Paid next month.	
	Pine										
July ...	Deodar ...	...	...	...	...	...	...	473	15,801	43,032 9 1	
	Pines										
August ...	Deodar ...	753	18,053	14,838 11 4	1,318	31,775	28,058 14 6	91	1,938	3,073 0 4	
	Pines ...	34	419		1	82					
September ...	Deodar ...	...	...	...	2,543	95,815	95,815 0 0	29	977	1,117 5 9	
	Pines										

October ...	Deodar ...	...	...	...	2,671	93,850	93,850 0 0				
	Pines ...										
November ...	Deodar ...	252	6,899	6,511 14 0	900	30,000	30,000 0 0				
	Pines ...	3	94								
December ...	Deodar ...	93	3,952	3,793 2 0	282	6,158	6,158 0 0	61 (sleepers)	...	228 12 0	
	Pines ...	1	168								
January ...	Deodar ...	...	...	...	779	22,357	13,784 0 0	982 (sl.)	...	1,798 8 0	
	Pines ...										
February ...	Deodar ...	...	...	...	...	...	...	578	19,408	12,344 10 6	
	Pines ...	...	...	...	...	...	...	and 1,824	sleepers.		
March ...	Deodar ...	...	...	...	2,688 Sleepers.	...	8,701 0 0	3,489	63,370	43,643 2 2	
	Pines ...	...	...	...	...	...	...	347	5,427		
Total for the official year only.	Deodar ...	1,345	35,711	31,110 3 4	12,557	3,18,776	3,15,911 5 6	11,834	1,06,921	1,05,257 15 10	
	Pines ...	38	681								

TABLE No. II.

Return of Timber supplied to the Northern (State) Railway for official year 1870-71.

Months.	Jhelum.				Chenab.				Ravee.				Remarks.
	Deodar.		*Pines.*		*Deodar.*		*Pines.*		*Dodar.*		*Pines.*		
	Logs	Cubic feet.	Logs.	Cubic feet.	Logs.	Cubic feet.	Logs.	Cubic feet.	Logs.	Cubic feet.	Logs.	Cubic feet.	
From October 1869 to March 1870 ...	1,595	5,61,772	...	...	2,122	45,343	133	2,191	6,475	41,866			
April ...	...	...	...	...	...	...	...	...	141	4,125			
May ...													
June ...	30	606	...	...	17	531							
July ...	281	5,732	...	...	508	7,589							
August ...	124	1,956	...	...	276	3,340							
September ...	...	...	...	...	80	1,914							
October ...	...	...	17	397	209	5,017	553	13,349					
November ...	...	...	51	1,527	47	1,345	...	...	639	6,257			
December ...	...	...	...	...	...	...	...	...	515	4,511			
January ...	...	...	...	...	1,602	34,928	591	12,567	281	650			
February ...	285	10,016	6	133	8	147	904 (includingsleepers)	8,755	587	15,568			
March ...	1,985	44,073	38	628	,415 (includingsleepers)	1,13,871	546	9,225	5,284	79,867			
Total for official year only ...	2,705	60,383	112	2,685	11,162	1,68,682	2,594	43,896	7,447	1,11,048			

TABLE No. III.

Statement shewing the Fuel Transactions with the Northern State Railway during the year 1870-71.

Month.	Division.	Balance on 1st April 1870.	Received.	Delivered.	Closing Balance.
		Maunds.	*Maunds.*	*Maunds.*	*Maunds.*
April ...	Central ...	1,93,083	29,531	96,151	1,26,463
	Northern ...	38,825	23,073	16,078	45,820
May ...	Central ...	1,26,463	73,299	56,084	1,43,678
	Northern ...	45,820	22,542	21,985	46,377
June ...	Central ...	1,43,678	...	10,878	1,32,800
	Northern ...	46,377	26,525	2,603	69,299
July ...	Central ...	1,32,800	4,200	8,742	1,28,258
	Northern ...	69,299	...	33,223	36,076
August ...	Central ...	1,28,258	...	829	1,27,429
	Northern ...	36,076	...	18,377	17,689
September ...	Central ...	1,27,429	...	12,093	1,15,336
	Northern ...	17,689	625	...	18,314
October ...	Central ...	1,15,336	...	...	1,15,336
	Northern ...	18,314	7,400	7,336	18,378
November ...	Central ...	1,15,336	...	...	1,15,336
	Northern ...	18,378	15,550	5,168	28,760
December ...	Central ...	1,15,336	...	35,000	50,000*
	Northern ...	28,760	10,975	7,390	32,345
January 1871 ...	Central ...	50,000	26,000	33,839	42,111
	Northern ...	32,345	15,690	9,919	38,116
February ...	Central ..	42,111	17,000	29,062½	30,048½
	Northern ...	38,116	14,229	18,864	33,481
March ...	Central ...	30,048½	10,000	18,540	21,508½
	Northern ...	33,481	21,011	21,902	32,590
			Total Delivery ...	4,64,063½	

System of rafting.

146. Returning now to the general work of the depôts. I may first note that Mr. Hilliers introduced a new system on the Lower Chenab that is worthy of general adoption. Instead of the old method of cutting out loops and fastening through them with grass rope, iron staples are used with chains, from which the following benefits arise :—

" 1. The loops at each end of the log cause a waste of say one foot of slab, which is worth say three annas per foot.

" 2. The contract price for cutting these loops was one rupee per hundred, which took a man upwards of three days to cut.

" 3. The strength of these loops is not to be compared to that of the iron staples.

" 4. The expenditure for the iron is less :—only nine pies per each staple of three-eighths* inch iron, and one anna per half † inch (for very large logs).

* 3 inches long.
† 4 inches long.

" 5. *The saving of timber.*—A raft can be prepared in an hour or two, for 206 staples can be driven with ease in a day.

" 6. I estimate that only 20 out of every 100 staples will be of no further use; these will be sold for old iron, and the others often being drawn out of the logs will be sent to the catching station by the man who comes down on the raft. Thus the stock will be continually going backwards and forwards."

Percentage of receipts of former launchings.

147. The percentage of receipts of timber on different years, felling can only be ascertained when it was known by a special mark in what year the timber was felled, and this has not been the practice until recently on several rivers, hence the difficulty of giving uniform information on this head for all rivers.

* The balance brought forward at the commencement of the month is reduced by 30,000 maunds, which was found short on measurement by Mr. McDonell, Assistant Conservator.

For the Jhelum.—This information cannot be given.

For the Chenab.—Receipts, 11,905 logs :—

1,665	or	13·8	per cent.	of	1862.
320	„	2·6	„	„	1863.
135	„	1·13	„	„	1864.
885	„	7·4	„	„	1865.
519	„	4·3	„	„	1866.
510	„	4·3	„	„	1867.
315	„	2·6	„	„	1868.
7,516	„	63·1	„	„	1869.
40	„	0·3	„	„	1870.
11,995 logs.					

For the Ravee.—This information cannot be given. It is uniformly observed on this river that Government timber arrives in a much more damaged state than the Kashmir timber. A report on this subject has been called for.

Beas.—Of 1,690 logs received (total No. 2,270) it was ascertained as follows :—

12	or	0·6	per cent.	of	1864.
62	„	3·6	„	„	1865.
352	„	20·8	„	„	1866.
80	„	4·7	„	„	1867.
587	„	34·7	„	„	1868.
596	„	35·2	„	„	1869.
1,690 logs.					

Sutlej.—Of 5,779 logs received and in hand :—

32 logs	or	1·71	per cent.	of	1869.
340 „	„	·79	„	„	1870.
4,371 „	„	·79	„	of	*wind-fall* of 1870.
492 „	„	·58	„	of	waif marked in river of 1870.
544 „	„	·73	„		toon logs from Pundrabis of 1870.
5,779 logs.		4·50			

148. The average cubic contents of logs received during the year is as follows :—

Average contents.

	C. F.	
Jhelum	16·23	
Chenab	20·5	
Ravee	16·34	Deodar 17·64 Pines 15·45
Beas	25·89	
Sutlej	11·17 cubic feet.	

149. Form No. 23 appended will shew the depôt receipts on timber.

150. Form No. 25 shews disposal of the stock ; 441 logs were lost by floods, 46,939 sold, and 46,386 remaining in hand at the close of the year.

Disposal of Stock.

151. Form No. 27 shews the amount which it cost to get 100 cubic feet of timber to depôt. The Beas and Jhelum shew best in this respect.

152. It may be convenient to close these remarks by a table shewing the dates of the best floods on the rivers for several years past.

Floods.

Rivers	1864-65.	1865-66.	1866-67.	1867-68.	1868-69.	1869-70.	1870-71.
Jhelum ...	...	...	...	No floods ...	...	Beginning of June, and 1st, 15th July.	Great flood, Kughan, 18th August, 1870, 24th February 1871.
Chenab ...	Great flood by land-slip in April. (Rep. 1865-6, p. 10).	Slight on June 16th, July 12th, Augt. 16th, considerable on September 16th.	8th August ...	No note ...	No floods ...	June 17th to September 15th.	Two floods only during rains, August 3rd and 18th.
Ravee ...	No floods ...	1st and 4th September "red" flood (from lower hills only). 14th and 16th September black floods (from upper river).	July 1st, 2nd and 14th, and fair floods on August 16th.	Heavy floods in July.	Do.	Slight 27th March, great flood 20th of July.	15th to 30th July, also one in August and one on 3rd September.
Beas ...	Do.	12th, 13th, 27th, and 28th July, 31st August, 14th and 17th September.	12th, 14th, 29th, 31st July, also 9th, 18th August.	1st, 19th, 24th, 28th July, 4th and 19th August.	Do.	18th September.	...
Sutlej ...	...	15th August ...	Beginning of July.	16th May to 20th August.	20th June ...	7th, 25th July, and 26th September.	26th July.

153. Lastly, under this I have to report the yield of special tracts of forests, which do not conveniently come under the head previously noted.

154. *Kaleson.* (In the Sutlej Division.)—This is a small valley, filled with sál of no great size, and suitable only for poles or rafters, and with brushwood fit for fuel. There has been no fresh cutting of poles this year, but 16,968 pieces remain in store from previous cuttings; 25,000 cubic feet of firewood were cut. The sale of grass and minor forest produce, however, alone pay for this tract. The income from these sources alone, Rs. 1,412-7-9, and the expenditure under all heads only Rs. 1,316-15-3. The fuel was cut for an experimental sale of firewood at Jagádri. It seems certain that the attention of the Railway authorities should be turned to this little forest. We could supply (Major Batchelor's estimates) a lac of maunds annually, but should require to put down a light tramway, which would need to be extended from a minimum of 2 miles to a maximum of 4. Certain wells to supply workmen with water would have to be dug, but the cost would be amply repaid if the fuel sold at Rs. 35 to Rs. 40 per 100 maunds.

155. *Bamboo and Cheel Forests.* (Beas Division.)—In the Hushyarpoor bamboo tracts 498,632 bamboos were cut and sold, and 10,310 issued gratis to right holders.

The bamboo forests in Noorpoor similarly yielded 35,050 bamboos, and 9,000 issued free. The cheel trees sold were only 627 in number. The bamboos yielded Rs. 9,543-2-3, and the cheel trees Rs. 1,474.

156. *Kalatop.* (Ravi Division.)—The work consisted in a limited felling of deodar and of *Abies Smithiana* (locally tôs) on the principle of direct work by Government agency.

56 deodars were felled, yielding—

Beams	25	= 650	cubic feet.
Kurrees	1,075	= 1,904	,,
Planks	1,927	= 1,854	,,
		4,408	,,

or nearly 90 cubic feet per tree.

Of this quantity 25 beams, 441 kurrees, and 207 planks were sold = to 1,712 cubic feet, at Re. 1 a cubic foot, leaving the rest in store (2,696 cubic feet).

Similarly 43 "tos" trees were felled, yielding 5,022 cubic feet, of which 2,116 were disposed of at Rs. 0-7-6 per cubic foot; also 8 whole trees felled were sold for Government works at Rs. 8 each.

The whole cost of sawing and carriage was Rs. 2,009, and establishment was Rs. 388; so that the quantity of timber sold, let alone the stock left to season, more than paid for the whole cost of this forest.

157. *Baklo Forests.* (Lower Ravi.)—During the year, 184 trees of *Pinus Longifolia* were sold to the 4th Goorkha regiment, and 34 to other parties. At the close of the year an indent for 1,000 trees (*Pinus Longifolia*) was sent in by the 4th Goorkha regiment, but I was obliged to decline giving more than 500 trees, and this will be quite a *final* supply. The neighbouring forests now possess hardly any trees fit to cut for the next 10 years more; one tract, Bela, alone contains a few trees over 4' in girth, and must be kept for reserve in case of urgent repairs, &c.; buildings on a large scale must absolutely be provided for in some other way. Only saplings exist in the neighbouring forests. The fate of the Kussowlie hills must be warded off from these forests at any cost.

158. *Fuel Reserves.*—The principal outturn of this division as regards supply of fuel has already appeared in the return for the Northern (State) Railway (*ante*, para. 145).

159. The grazing income forms another principal source of receipt in this division. During the year one difficulty was felt owing to the question whether grass collections in rukhs (when it was collected by what is called the Tirni system), on enumeration of heads of cattle, should be managed by this

department or the District Officers. This is one of the questions that will be definitely settled when orders are issued on the report of final transfer appended (A.)

160. The grazing in the district of Goojranwalla fell off heavily, owing to there having been in the previous years a serious cattle disease, causing heavy losses to the grazing contractors. There were heavy arrears and balances to clear off, and the market was affected accordingly.

161. The leases were sold, for the following amounts :—

		Rs.	A.	P.
Amritsar	...	1,200	0	0
Lahore	...	30,341	11	9
Goojranwalla	...	40,984	14	0
Montgomery	...	61,780	15	0
Multan	...	2,885	8	6
Mozuffergurh	...	2,405	14	0
Jhung	...	1,839	0	0
Total	...	1,41,437	15	3

162. The whole of these receipts were not, however, credited to this department. It is not until the close of 1871-72 that the whole of the income will come to us; the transfer was only in progress during the year, and finally reported as complete at the close.

163. The Plantation Division yielded from grazing fees Rs. 4,929-14-9. In this Division also Rs. 13,580-6-3 was realized by sale of wood cleared off ground prepared for planting. Receipts from cultivation and "miscellaneous" produced Rs.2,904-11-10, so that already the Division is beginning to have some income to set off against the capital sunk in planting operations.

Chapters II. and III., regarding village and unreserved forests, are at present blanks in the Punjab.

SECOND PART.

General.

164. *Financial Results.*—The control of Forest Accounts has during this year been vested in this office with Mr. Amery, Deputy Conservator, in special charge of the Accounts Branch. This officer has furnished a note on the financial results observed during the compilation of the annual returns, which I here quote *in extenso.*

165. With reference to Mr. Amery's observation at para. 179 on the general results of the year, I should add that a sum of about Rs. 18,000 realized from the rukhs under our charge which have been ordered to be credited to our revenue (as derived from our rukhs), is not included in the present return, as the orders determining the question were received after closing the books. Taking the actual expenditure of Rs. 12,35,809, and income of Rs. 10,24,420, we have a deficit of Rs. 2,11,389 ; but against this it may be remembered that I have the Rs. 18,000 above mentioned.

Apparent deficit.

I have further timber stock to the value of Rs. 5,27,000, a great portion of which (though readily saleable) is compulsorily unrealized. Besides this a large sum has been expended in purchasing felled timber in the forests (see para. 76),which will be realized in future years.

Adverting also to the form No. 28, it will be seen that taking all these matters into consideration, there is really, though not ostensibly, a profit of nearly a lac of rupees, to which is to be added Rs. 18,000 before mentioned.

Actual profit more than Rs. 1,18,000.

166. In fact I am very much mistaken if we are not on the turning-point of making a considerable profit, and I shall relinquish charge of this department this year with some disappointment, because I believe that the next returns must show a much greater result.

167. For instance, if orders are passed at an early date confirming the transfer of rukhs, our miscellaneous income will be increased. In the present year there is an expenditure of nearly a lac of rupees on the extensive "cheel" cuttings reported in para. 116-118. Next year's report will shew all the income of this transaction without its expense. The Indus stock *must* be converted, and there will be no probability of such a depôt stock being on hand again.

168. Lastly, I have to observe that we do not take credit for many items that are properly to be included in Stock Accounts, such as value of forest houses and other property, value of stock in transit, value of standing timber and annual growth. All these are omitted, and may be shewn next year.

169. Mr. Amery's remarks are as follows; he has also appended a note to Form 28, to which I request attention.

Value of stock modified in this year's returns.

170. The figures accepted as representing the value of the quick and dead stock at the close of last year have been subject to modifications from various causes,—1st, timber stock on some forest officers' returns represented stock in the selling depôts only, and in other returns it included the timber in all the depôts on the river. This want of uniformity in practice was not discovered till after the lapse of some months, when it was observed that the difficulty was further heightened by the fact that, while some officers' annual returns agreed with the stock brought forward in their monthly returns at 1st April 1870, there were others whose annual returns embraced the timber in all their depôts; while their monthly returns were for that in the selling depôt or depôts only. In my books I have accepted the monthly returns as the basis of the stock accounts of the year. Another cause of discrepancy was the absence of any just relation between the money value fixed and the selling prices of the several rivers, some officers having estimated their stock above and others below its market value. After making the necessary corrections here, I have entered the value of timber stock at 1st April 1870 as Rs. 3,22,636, instead of Rs. 3,40,595 as given in last year's returns.

171. In all previous returns no account has been taken of the stock in the forests or in course of transit to depôts, and, as during the year we have paid Rs. 23,000 for Mir Sooltan's timber laying in the Chamba forest, and effected large purchases of timber in the river, very little of which has come to depôt, the urgent necessity of maintaining a different system of stock account has forced itself upon me. To meet this necessity, I have called for a return of stock laying in the forest, in course of transit, and at selling depôts, on 1st April 1871.

172. The difficulty of counting logs scattered over a large forest area or jammed in the river will make this return no more than an approximate, but even such an approximate return will, I apprehend, prove of great assistance in determining the value of our operations in future years. This additional stock I have not included in the present annual returns, as the profit which would thereby be shown is properly divisible over the last seven or eight years' operations. The stock returns at close of the year agree with the monthly returns, which have been accepted as the basis of other years' transactions; but the estimated value of the forest and transit stock has been shown in a footnote and will be brought forward as the basis of accounts in next year's returns. For the current year arrangements have been made for the submission of one return of stock in selling depôts, in which timber sold elsewhere will be shown both as a receipt and issue, and a second return embracing the stock on all non-sale depôts, the receipts and issues of which will be from and to the river. This will enable me to keep a ledger account of forest stock, river stock, transit depôt stock, and sales depôt stock, the river stock account being corrected at intervals of three or four years by actual counting of logs.

173. *2nd.—Outstandings on account of sales and advances to contractors.* This sum, set down in the last annual return as Rs. 2,03,828, or, with the amount of Rs. 1,07,392, struck off the outstandings and credited as revenue realized during 1869-70 by the Accountant-General, Rs. 3,11,220, has been corrected to Rs. 3,94,974. This discrepancy has been traced to the system of passing final charges, —sums which should properly have been carried to a head of recoverable advances.

Under this system the Accountant-General could presume no record of forest outstandings except on the basis of the contractor's ledgers, an abstract of which

was submitted monthly ; but from this abstract it was quite possible to exclude payments without the omission being traceable through the cash book, all charges in which were passed as final payments when supported by vouchers. This state of affairs necessitated a voluminous correspondence, from which it was elicited (1st) that outstanding advances made by one officer for another division or sub-division were, in some instances, shown as assets by both officers ; (2nd), short payments were made by one officer and passed in the accounts as final, while under his instructions they were shown in the other contractor's ledger without any clue as to the when or by whom the advance had been made ; and (3rdly), there were numerous recoverable items, aggregating a large sum, of which Forest Officers preserved records in their office, but which had never been shown in their abstract ledger sheets.

174. This system has now been done away with,—unrecorded outstandings traced out and brought forward. The cash books are now carefully scrutinized to see that none but *bonâ fide* final payments are passed as such, and a ledger account of recoverable advances maintained, by which any omissions in the divisional abstract ledgers are readily traced and rectified.

175. These alterations show an increase in the value of this class of assets of Rs. 83,570, or Rs. 65,794 on all heads ; thus :—

Assets as per last Annual Report.		*Assets now shown.*	
		Sales' account ...	Rs. 1,65,175
Outstanding ...	Rs. 2,03,828	Contractors' account	„ 2,29,799
Stock ...	„ 3,40,569	Stock ...	„ 3,22,636
Total ...	Rs. 5,44,425	Total ...	Rs. 7,17,610
		Deduct amount shown as revenue in last year's return ...	Rs. 1,07,392
			Rs. 6,10,218
			„ 5,44,424
		Net increase in value of assets brought forward ...	Rs. 65,794

176. The sales during the year amounted to—

Depôt Stock	Rs. 7,12,778
Forest Products	„ 2,47,468
Total sales ...	Rs. 9,60,246
The revenue realized was ...	„ 10,24,420
showing a realization from outstanding debts of ...	Rs. 64,174
which is found to agree with the outstanding account, which was at 1st April 1870 ...	„ 1,65,175

Cash realizations ...	Rs. 64,174	
Written off to profit and loss ...	„ 33,942	
Excess charged in Chenab Division to Northern (State) Railway, written back...	„ 2,913	
Transferred to contractors' account ...	„ 127	
Balance due at close ...	„ 65,019	
		Rs. 1,65,175

177. The contractors' accounts at opening of the year

showed due to Depot			... Rs.	2,29,799
During the year the cash advances made amounted to			... „	5,17,243
And they were debited with transfers			... „	1,006
		Total	... Rs.	7,48,048
The cash recoveries were		... Rs. 6,10,407		
Written off to profit and loss ... Rs. 911				
Recovered by transfers to other accounts ... „ 564		1,475	Rs.	6,11,882
showing a balance at close of			... Rs.	1,36,166
being a reduction of			... Rs.	93,633
of which was written off to profit and loss			... „	911
leaving			... Rs.	92,722

available for expenditure in addition to the drafts against budget grant.

178. The gross expenditure of the department under budget heads is shown as Rs. 12,35,808 ; but of this sum Rs. 19,066 was recovered in cash and Rs. 92,722 by recoveries from contractors in excess of advances made them, leaving a net expenditure of Rs. 11,24,022 against the budget grant as per Form 28.

179. In this Form (28) I have shown the transactions of the year as resulting in a loss of Rs. 67,663 ; but it has been explained that this apparent loss is qualified by a large productive expenditure on account of plantations ; by a reduction in the value of assets, which, having proved unrealizable, were written off to profit and loss within the year ; and by purchases of timber, which, not having reached the selling depôt, is not included in the assets at the close of the year.

180. Making due allowance for these circumstances, it will appear that the financial results of the year have been fairly good. At the same time, I don't think the returns give any just data for the reduction of our selling rates ; for it will be observed that 25 per cent. of the year's revenue was realized from what I have called "forest products," which includes all sources of revenue excepting depôt stock.

181. In the Bear Division an attempt was made to create a market by lowering the rates, and although Mr. Duff, the officer in charge, succeeded in bringing his timber to depôt at a lower cost than has been done elsewhere, thereis a loss in the transactions of the year ; and I am afraid we cannot urge that reproduction has been on a scale to compensate for it.

182. In Form 28 I have given the total expenditure against the budget grant, which are the figures arrived at by the system of previous years, under which the adjustment of contractors' outstandings were eliminated from the accounts ; but in Form 27, in estimating the cost of timber brought to depôt, I have charged only proportion of the outlay on account of dead stock and buildings as has been estimated to be due to depreciation in value (25 per cent).

183. Direction charges have been apportioned in the ratio of the outlay of the several divisions, which appears a fairer system than dividing it equally among all the divisions.

General Remarks.

184. Nothing now remains for me to add but that the work of this department is being rapidly consolidated into a system ; and to express a regret that this may be the last annual report I shall have to write.

Seeds from foreign Governments.

185. I should here notice that much assistance has been received during the year from foreign countries in the matter of seeds. A large supply of *Eucalyptus* has been received from the

Australian Government. The Algerian Conservator of Forests has notified the despatch of a valuable collection of the *Atlas Cedar*,* and other trees (cork and oak have been despatched, but have unfortunately not been received up to date.

* Since received. B. P.

186. I should here record the acknowledgment of this department to Captain R. Palmer, Lieutenant Jenner, and Mr. Phelan, of the Canal Department, whose cordial co-operation in the matter of water-supply has so materially contributed to the success of the Plantation.

Co-operation of Canal Officers.

187. My special acknowledgments are due to Mr. Amery, Deputy Conservator, who has organized the account office most efficiently; to Mr. Ribbentrop and Mr. B. Brown for their work in the Plantation and the Fuel Reserve Division.

Notice of Officers.

188. Among the Assistant Conservators, Mr. Duff's work has already been commended, as also that of Mr. Ellis. Mr. Sparling, Mr. Hillier and Mr. Home also deserve commendation. Mr. Righy's careful and conscientious management of the Lower Ravee deserves great praise. Mr. Minniken, in the Plantation Division, and Mr. Watters, on the Jhelum, also deserve favorable notice.

189. The prescribed returns No. 11 and 20-28 are appended.

B. POWELL,

Offg. Conservator of Forests, Punjab.

No. 11

Forest Department, Punjab.

Account of trees felled, logged, and timber launched in the different Forests during 1870-71.

Division.	On hand at the commencement of the year.	Logged and confiscated.	Total.	Launched.	Remained in Forest.	Received in Depôt.	Remarks.
	Logs.	Logs.	Logs.	Logs.	Logs.	Logs.	
Sutlej...	1,302	7,070	8,372	7,502	870	5,779	
Beas	4,355	1,405	5,760	3,314	2,446	2,270	
Ravee...	1,859	16,815*	18,674	16,941	1,733	17,721	
Chenab	1,887	25,127	27,014	27,014	...	27,310	
Jhelum	8,780	9,768	18,548	13,033	5,515	7,374 and 2,257 Sleepers.	

* Of these 208 are unlogged trees.

C. F. Amery, *Deputy Conservator,*
for *Conservator, Forests, Punjab.*

No. 20,

Forest Department, Punjab.

Conservator's Abstract book of summary of expenditure for the year 1870-71.

EXPENDITURE IN CONSERVANCY AND WORKING.

Name of budget heads.	April.			May.			June.			July.			August.			September.			October.			November.			December.			January.			February.			March.			Total.		
	Rs.	A.	P.	Rs.	A	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A	P	Rs.	A.	P.
EXPENDITURE.																																							
A.—Conservancy and Working.																																							
I.—Timber Expenses ...	9,574	2	11	69,340	12	4	82,608	15	11	87,114	12	5	91,573	2	8	1,13,163	7	8	1,27,595	0	2	51,432	6	5	25,892	3	7	49,750	10	5	1,17,727	5	8	74,205	2	11	8,99,978	3	1
II.—Purchase of stock ...	773	0	11	1,539	3	4	1,211	3	4	650	8	0	739	0	1	279	2	6	372	11	7	362	9	6	249	10	9	419	3	0	704	12	3	837	9	11	8,138	11	2
III.—Feed and keep of cattle,	39	4	0	39	0	0	40	12	0	66	12	7	45	4	4	30	8	0	34	0	0	31	12	0	33	2	0	330	15	7	117	3	0	97	15	4	906	8	10
IV.—Rent of leased forests ..	10,082	12	0	...	..	..	...	...	...	...	...	...	...	..	...	10,993	4	0	100	15	10	1,650	0	0	44	3	0	...	...	...	...	.	...	...	...	...	22,871	2	10
V.—Charges in collecting revenue on grass, &c. ...	...	...	.	20	0	0	0	4	0	...	...	.	...	..	.	60	14	7	...	..	...	...	...	...	...	...	.	...	...	...	...	...	.	...	.	.	81	2	7
VI.—Plantations ...	12,076	8	5	2,717	11	2	13,146	15	4	3,589	8	8	9,029	14	8	2,720	10	9	13,136	3	7	71	12	0	1,183	5	1	3,993	8	1	2,498	0	7	5,339	14	0	69,504	0	4
VII.—Forest work ...	...	..	.	...	.	.	13	11	2	18	2	0	...	..	...	...	...	...	...	.	...	1,765	13	5	...	...	...	...	..	...	...	...	.	...	...	.	1,797	10	7
VIII.—Forest surveys ...	170	0	0	79	10	9	546	3	7	612	9	1	375	1	0	624	11	9	372	11	7	382	6	8	864	8	3	1,194	3	9	277	4	9	950	4	2	6,449	11	4
IX.—Experiments on timber,	...	...	..	...	..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	.	...	8	0	0	...	...	...	...	...		8	0	0
X.—Communications and buildings ...	1,021	15	7	1,344	12	0	2,923	14	3	2,007	12	4	1,000	1	6	6,107	5	3	1,139	7	5	1,521	14	11	1,652	5	10	320	13	6	153	6	0	2,272	10	4	21,466	6	11
Total ...	33,737	11	10	75,081	1	7	1,00,491	15	7	94,060	1	1	1,02,762	8	3	1,33,980	0	6	1,42,751	2	2	57,218	10	11	29,919	6	6	56,017	6	4	1,21,478	0	3	83,703	8	8	10,31,201	9	8
B.—ESTABLISHMENTS.																																							
I.—Salaries.																																							
1. Pay of Conservator ...	...	...	...	...	...	...	...	...	...	...	...		...	...	...	...	...	...	...	...		...	...	...	...	...	...	...			...	...	.	1,160	0	0	1,160	0	0
2. Pay of Executive Officers ...	5,903	1	0	4,373	4	0	7,800	0	0	5,450	0	0	5,600	0	0	6,050	0	0	4,450	0	0	6,550	0	0	5,770	14	4	6,212	14	5	8,412	12	3	10,461	12	2	77,034	10	2
3.—Office Establishments ...	80	0	0	463	6	7	1,310	5	1	1,385	11	6	1,341	5	0	1,636	10	0	813	0	0	653	0	0	972	0	0	651	3	7	377	0	0	944	2	10	10,627	12	7
a.—Direction BI., BII., BIII	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	...	...	...	...	...	..	..	...	..	...	..	..	..	.	..	26,481	8	7	...	...	..	26,481	8	7
b.—Executive ...	1,187	7	8	2,101	14	4	2,452	3	5	1,060	0	0	2,624	10	3	1,159	0	0	1,122	9	3	1,409	4	8	1,613	2	6	1,523	3	6	443	0	0	413	0	0	17,109	7	7
4. Forest Conservancy and Establishment ...	2,149	4	3	1,148	0	0	606	0	0	1,174	0	0	...	...	...	1,943	14	7	1,431	0	0	2,116	9	0	4,531	8	9	2,341	5	0	4,251	11	0	3,665	10	6	25,358	14	4
5. Timber Depôt and Work Establishment ...																																							
6. Deputation and special allowance ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	...	...	.	...	..	...	...	.	...	...	...	...	...	...	..	...	..	..	...	..	...
II.—Travelling allowance.																																							
1. Conservator ...	...	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	..		...	...	..	...	..	...	...	..	..	...	...	..	...		..	108	0	0	108	0	0
2. Executive Officers ...	2,766	0	4	2,257	1	6	1,972	9	0	2,561	0	10	2,268	1	6	2,156	11	0	1,665	8	0	2,595	9	0	3,400	8	1	2,538	14	9	3,143	5	8	2,029	12	2	29,355	1	10
3. Depôt and Forest Establishments,	441	3	5	427	0	4	622	8	4	681	5	0	476	9	4	955	10	11	582	8	2	677	8	5	657	9	3	420	9	1	428	11	3	255	14	7	6,627	0	1
III.—Contingencies.																																							
1. Stationery ...	129	13	0	222	7	11	332	4	5	164	7	3	188	6	2	351	1	4	235	4	3	268	2	1	75	13	0	150	10	6	178	5	2	242	6	0	2,539	1	1
2. Office rent and carriage of fruits, &c. ...	337	2	1	477	4	6	400	5	10	316	7	0	451	8	1	501	7	0	450	11	7	403	2	9	204	8	6	372	4	0	176	8	3	350	13	0	4,442	2	7
3. Pay of Police guard ...	9	4	0	...	.	...	6	8	0	...	...	.	...	..	.	46	10	8	...	..	...	...	..	...	...	...	.	...	...	...	...	...	...	...	...	...	62	6	8
4. Sundries ...	582	9	11	340	9	7	274	3	0	190	2	6	184	10	0	314	14	2	110	10	0	107	6	6	170	13	0	308	2	0	795	7	1	321	6	7	3,700	14	4
Total ...	13,585	13	8	11,811	0	9	15,776	15	1	12,983	2	1	13,135	2	4	15,115	15	8	10,861	3	3	14,780	10	5	17,396	12	8	14,519	..	10	44,688	5	3	19,952	13	10	2,04,606	15	10
Grand Total ...	47,323	9	6	86,892	2	4	1,16,268	14	8	1,07,043	3	2	1,15,897	10	7	1,49,096	0	2	1,53,612	5	5	71,999	5	4	47,316	3	2	70,536	7	2	1 ,66,1	5	6	1,03 656	6	6	12,35,808	9	6

Dated Lahore, May 1871.

C. F. Amery, *Deputy Conservator,*
for *Conservator of Forests, Punjab.*

No. 21.

Forest Department, Punjab.

Annual summary of revenue and expenditure in the different Divisions during 1870-71.

Classification.	Direction.			Sutlej.			Beas.*			Ravee.			Chenab.			Jhelum.			Fuel Reserve.			Fuel Plantation.			Total.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Receipts.																											
I.—Sale of timber at Depôts ...	...	...	...	2,835	5	3	51,228	13	11	2,16,886	13	9	3,06,066	0	2	69,705	1	5	46,122	6	1	..	...	...	6,92,844	8	7
II.—Sale of timber removed by purchasers ...	...	...	...	598	13	0	10,034	3	1	12,938	8	0	4,283	0	5	6,045	13	10	1,31,454	2	2	13,518	6	3	1,78,872	14	9
III.—Duty on Foreign timber ...	...	...	...	70	0	0	...	...	...	...	..	.	...	...	...	...	...	...	...	...	..	...	...	...	70	0	0
IV.—Permit Fees ...	...	...	...	37	10	0	...	...	...	...	..	...	...	...	...	...	...	...	...	...	...	61	11	3	99	5	3
V.—Grazing dues ...	...	...	...	319	15	9	195	5	0	...	..	..	...	..	...	229	5	11	77,114 45,913	1 0	4 0	4,929	14	9	1,28,701	10	9
VI.—Sale of fruits, &c., ...	...	...	...	114	10	0	42	3	0	...	..	...	...	...	...	...		...	...	...	...	136	5	3	293	2	3
VII.—Sale of confiscated timber ...	...	...	...	...	...	...	38	7	0	...		...	...	...	...	10	0	0	...		...	...	...	...	48	7	0
VIII.—Fines and forfeitures ...	...	...	...	445	4	0	336	3	9	2	6	5	421	4	0	1,715	13	6	544	15	11	275	8	4	3,741	7	10
IX.—Miscellaneous ...	...	...	...	169	9	0	734	3	11	...	...	...	1,668	13	5	321	14	1	13,948	13	5	2,904	11	10	19,748	1	8
Total Receipts	...	...	...	4,591	3	0	62,609	7	8	2,29,827	12	2	3,12,439	2	0	78,028	0	9	3,15,097	6	11	21,826	9	8	10,24,419	10	2
Conservancy and Working.																											
I.—Timber expenses ...	...	...	...	18,136	4	0	17,373	11	6	2,39,702	10	2	3,78,101	4	7	1,34,820	13	7	1,08,585	2	3	3,258	5	0	8,99,978	3	1
II.—Purchase of stock and cattle ...	...	...	...	2,217	10	7	547	1	0	1,021	15	11	1,686	7	3	1,157	12	5	54	8	0	1,423	4	0	8,138	11	2
III.—Feed and keep of cattle ...	...	...	...	25	5	6	0	12	0	...	...	...	397	8	6	...	...	...	482	14	10	...	...	...	906	8	10
IV.—Rent of leased forests ...	...	...	...	1,650	0	0	145	2	10	...	..	...	19,750	0	0	1,326	0	0	...	...	...	...	...	...	22,871	2	10
V.—Charges on collecting revenue on grass and fruit ...	...	...	...	...	.	...	...	...	...	60	14	7	...	...		20	0	0	...	...	...	0	4	0	81	2	7
VI.—Plantations ...	...	...	...	582	11	0	271	6	9	199	3	0	273	12	0	106	9	8	116	8	0	69,719	11	4	71,269	13	9
VII.—Forest work ...	...	...	...	...	...	...	...	...	..	31	13	2	...	...	.	...	.	..	...	...	...	...	...	...	31	13	2
VIII.—Forest surveys ...	...	...	...	...	...	...	121	0	0	2,501	11	3	2,683	11	6	40	0	0	785	15	4	317	5	3	6,449	11	4
IX.—Experiments on timber ...	...	...	...	...	..	...	...	...	...	...	...	.	8	0	0	...		...	...	...	..	...	...	...	8	0	0
X.—Communications and buildings ...	...	...	...	3,149	5	11	2,032	12	10	5,135	11	0	4,059	4	11	1,356	2	3	849	14	0	4,883	4	0	21,466	6	11
Total Conservancy and Working ...	...	...	...	25,761	5	0	20,491	14	11	2,48,653	15	1	4,06,960	0	9	1,38,857	5	11	1,10,874	14	5	79,602	1	7	10,31,201	9	8
Establishment.																											
I.—Salaries ...	2,015	0	0	16,026	11	0	14,471	3	0	8,968	11	0	14,229	11	7	12,806	7	0	38,956	11	10	23,816	5	3	1,31,290	12	8
II.—Travelling allowance ...	118	0	0	5,164	9	9	3,548	12	10	3,738	4	9	5,311	14	0	3,996	14	0	6,744	11	5	7,466	15	2	36,090	1	11
III.—Contingencies ...	644	8	1	1,129	0	2	990	3	5	643	9	7	2,092	5	8	1,525	11	1	1,714	14	11	2,004	3	9	10,744	8	8
Direction charges under BI., BII., BIII., ...	26,481	8	7	...	...	...	...	...	...	...	..	...	...	..	...	...	...	...	...	...	...	...	...	...	26,481	8	7
Total Establishments, &c. ...	29,259	0	8	22,320	4	11	19,010	3	3	13,350	9	4	21,633	15	3	18,329	0	1	47,416	6	2	33,287	8	2	2,04,606	15	10
Grand Total Expenditure ...	29,259	0	8	48,081	9	11	39,502	2	2	2,62,004	8	5	4,28,594	0	0	1,57,186	6	0	1,58,291	4	7	1,12,889	9	9	12,35,808	9	6

Dated Lahore, May 1871.

C. F. Amery, *Deputy Conservator,*
for Conservator of Forests, Punjab.

No. 22.

Cr. *Annual Abstract account of the cash transactions during* 1870-71. *Dr.*

	Rs.	As.	P.		Rs.	As.	P.
To cash balance at 1st April 1870 ...	1,25,840	0	0	By expended items chargeable to works including allowance for wear and tear of stock and buildings ...	12,14,773	0	0
„ *Government* drafts upon Treasuries ...	10,78,558	0	0	„ Balance of expenditure on acconnt of dead stock and buildings ...	21,037	0	0
„ „ Income Tax ...	2,643	0	0	*Government.* -			
„ „ Funds ...	113	0	0	Remitted to Treasury and transferred to Accountant-General for adjustment ...	11,49,133 †	0	0
„ Revenue from all sources ...	10,24,420	0	0	Refund Revenue, Beas Division ...	15	0	0
„ Recoveries from Contractors ...	6,10,971	0	0	Advances to Contractors ...	5,18,249	0	0
„ Cash recoveries ...	19,066	0	0	By cash balance on 31*st March* 1871 ...	28,883	0	0
„ *Tansfers* postages ‡ ...	479	0	0				
Total Rs. ...	29,32,090	0	0	Total Rs. ...	29,32,090	0	0

* This sum includes transfer to the debit of the Forest Department.
† This sum includes one lac of rupees standing to the debit of the Executive Engineer, Pesháwar, and withdrawn under instructions of Accountant-General, Punjáb.
‡ This includes the charges submitted by the Lahore Office only.

C. F. AMERY *Dy. Conservator,*
for *Conservator of Forests, Punjáb.*

Dated Lahore, 11*th May,* 1871.

No. 23.

FOREST DEPARTMENT, PUNJAB.

Annual Statement of outstandings and liabilities of the Department on account of Contractors and Disbursers during 1870-71.

Divisions.	At opening.	Payment.	Revenue.	Balance due by Contractors.	Balance due to Contractors.
	Rs.	Rs.	Rs.	Rs.	Rs.
Sutlej ...	1,094	8,300	2,738	4,656	...
Beas ...	4,130	12,204	12,719	3,615	...
Ravee ...	25,018	1,19,123	1,44,542	...	401
Chenab ...	3,937	25,415	29,352	...	...
Jhelum ...	*1,15,805	1,24,126	2,19,637	20,294	...
Fuel Reserve ...	60,005	1,54,667	1,12,455	1,02,217	...
Fuel Plantations ...	19,808	74,414	88,437	5,785	...
Total, Rs. ...	2,29,797	5,18,249	6,11,880	1,36,567	401

* This includes one lac of of rupees standing against the Executive Engineer, Peshawár, for purchase of timber on the Indus.

Outstanding on sale Account.

Divisions.	At openig.	Supplies.	Revenue.	Balance due.
	Rs.	Rs.	Rs.	Rs.
Sutlej ...	1,343	7,452	1,343	7,452
Beas ...	22,250	18,660	38,504	2,406
Ravee ...	76,409	5,620	66,157	15,876
Chenab ...	65,173	17,776	73,855	9,094
Jhelum ...	...	6,907	2,792	4,115
Fuel Reserve ...	...	62,566	36,486	26,080
Total ...	1,65,175	1,18,981	2,19,137	65,019

LAHORE :
The 11*th May* 1871.

C. F. AMERY, *Dy. Conservator,*
for *Conservator of Forests, Punjáb*

No. 24.

FOREST DEPARTMENT, PUNJAB.

Statement of Timber brought to Depôts from the different Forest Divisions during 1870-71.

Name of River or Division.	Forest.	Description of Timber.	Pieces.	Cubic feet.	Totals of each River. Pieces.	Totals of each River. Cubic feet.	Remarks.
Sutlej ...	...	Deodár ...	5,235	62,395			
		Toon ...	544	2,173	5,579	*64,568	
Beás ...	...	Deodár ...	2,272	62,000			
		Pines ...	498	9,711	2,770	71,711	
Ravee ...	...	Deodár ...	11,843	225,962			
	...	Pines ...	3,738	57,818			
	...	Sleepers ...	64	442			
	...	Beams ...	9	142			
	...	Kurries ...	2,067	4,316	17,721	288,680	
Chenab ...	...	Deodár ...	17,232	432,918			
	...	Pines ...	6,859	119,303			
	...	Sleepers ...	3,259	6,250	27,350	558,471	
Jhelum ...	...	Deodár ...	3,115	77,059			
	...	Pines ...	4,259	53,600			
	...	Sleepers ...	2,257	5,712	9,631	136,371	
Indus ...	...	Deodar ...	3,620	109,365	3,620	109,365	

* This includes 401 logs returned as in Depôt at close of last year, estimated at 4,800 cubic feet.

C. F. AMERY *Dy. Conservator,*
for Conservator of Forests, Punjáb.

No. 25.

FOREST DEPARTMENT, PUNJAB.

Annual Timber account for the year 1870-71.

Particulars.	Pieces.	Total.
I.—Stock in hand at the following Depôts at commencement of the year.		
Sutlej	401	
Beas	1,795	
Ravee	6,184	
Chenab	9,563	
Jhelum	3,364	21,307
II.—Timber received at Depôt from Forests.		
Sutlej	5,378	
Beas	2,770	
Ravee	17,721	
Chenab	27,310	
Jhelum	9,630	
Indus	3,620	66,429
		87,736
Excess in Chenab due to sawing up for sleepers	...	30
Total pieces ...	...	87,766

Particulars.	Pieces.	Total.
I.—Timber removed by purchasers from Depôts.		
Sutlej	361	
Beas	2,565	
Ravee	10,960	
Chenab	22,201	
Jhelum	4,852	40,939
II.—Lost by floods.		
Beas	...	441
III.—Stock in hand at the close of the year at the following Depôts :—		
Sutlej	5,418	
Beas	2,000	
Ravee	12,504	
Chenab	14,702	
Jhelum	8,142	
Indus	3,620	46,386
Total pieces ...	...	87,766

LAHORE :
The 15*th May* 1871.

C. F. AMERY, *Deputy Conservator,*
for *Conservator of Forests, Punjáb.*

No. 26.

FOREST DEPARTMENT, PUNJAB.

Statement shewing the amount realized on account of the different classes of Timber sold during 1870-71.

Divisions.	Number of logs sold.	Cubical contents.	Amount realized on account of Timber sold.	Average amount per log.	Average cubical contents of log.	Average amount per 100 cubic feet.
			Rs.	Rs.		Rs. As. P.
Sutlej ...	361	8,649	8,344	$23\frac{1}{9}$	23·96	97 10 0
Beas ...	2,565	60,668	31,668	$12\frac{1}{3}$	23·65	52 3 0
Ravee ...	20,095*	1,40,745	1,73,633	$8\frac{3}{5}$	7·1	123 6 0
Chenab ...	17,649	3,19,737	2,65,717	$18\frac{1}{8}$	18·11	83 1 0
Jhelum ...	4,852	98,845	73,819	$15\frac{1}{4}$	20·37	74 10 0
	45,522	6,28,646	5,53,181	$12\frac{1}{8}$	13·80	88 0 0
Deduct amount due but not realized during the year ...			11,290			
Balance ...			5,41,891			
Add amount realized on account of former years ...			1,18,723			
Total shewn as revenue on account of Timber sales ...			6,60,614			

C. F. AMERY, *Dy. Conservator,*
for *Conservator of Forests, Punjáb.*

* This includes purchased Timber not shewn as receipts and issues in stock returns, and also includes 10,000 sleepers.

No. 27.

Forest Department, Punjab.

Statement shewing the amount expended on account of Timber received from the different Forests during 1870-71.

Name of Divisions.	Number of logs.	Cubical contents.	Timber expenses.	Conservancy expenses, cost of establt., &c., of the Department, including Direction.	Total amount expended, including Direction.	Average amount paid per log.	Average cubical contents per log.	Average amount paid per 100 cubic feet.	Remarks.
			Rs.	Rs.	Rs.	Rs. A. P.		Rs.	
Sutlej ...	5,378	59,766	21,543	23,420	44,963	8 6 0	11·11	75·23	
Beas ...	2,770	71,711	17,454	19,960	37,414	13 8 0	25·89	52·17	
Ravee ...	17,721	288,080	2,28,330	19,800	2,48,130	14 0 0	16·25	86·13	
Chenab	27,310	560,471	4,06,458	31,042	4,37,500	16 0 0	20·50	78·05	
Jhelum ...	9,630	156,371	1,37,101	22,204	82,600	5 9 0	16·23	52·22	
Indus ...	3,620	109,363			76,705	12 3 0	30·02	70·14	
Total ...	56,429	1,345,764	8,10,886	1,16,426	9,27,312	16 7 0	23·85	68·90	

C. F. Amery, *Deputy Conservator,*
for *Conservator of Forests Punjáb.*

No. 28.

FOREST DEPARTMENT, PUNJAB.

Annual Account of Forest Revenue for the year 1870-71.

	Rs.
Receipts	10,24,405
Expenditure	11,24,022
Deficit	99,617
Difference in favor of assets	1,39,346
Profit on the year	39,729
Adjusted by deduction of amount credited as revenue in 1869-70 ...	1,07,392
Loss on the year, Rs. ...	67,663

Detail of difference between assets and liabilities at the commencement and close of the year.

		At the commencement of the year.	At the close of the year.	Difference. In favor of the year.	Difference. Against the year.
		Rs.	Rs.	Rs.	Rs.
Value of Timber stock ...		3,22,636	5,27,344	2,04,708	
Dead stock and buildings ...		3,788	24,823	21,035	
Outstanding on sales account ...	Rs. 1,65,175				
Deduct amount shewn as revenue in last year ...	Rs. 1,07,392	57,783	65,019	7,236	
Deduct on account of Contractors ...		2,29,799	1,36,166	...	93,633
		6,14,006	7,53,352	2,32,979	93,633
Deduct ...				93,633	
Balance in favor of the year ...				1,39,346	

The correctness of this return is demonstrated as follows:—

To—	Rs.	By—	Rs.
Value of stocks at 1st April ...	6,14,006	Government	11,49,133
Cash in hand ...	1,95,840	Value of stock at 31st March ...	7,53,352
Government ...	10,81,793	Cash balance ...	28,883
	18,91,639		
Profit on the year ...	39,729		
Total, Rs. ...	19,31,368	Total, Rs. ...	19,31,368

NOTE.—In qualification of the above there has been an expenditure over income of Rs. 87,950 in the Plantation Division, which may be regarded as reproductive. Rs. 33,853 of old assets have been written off to Profit and Loss, and a considerable quantity of timber has been purchased on the Ravee at a cost of about Rs. 45,000, but which not having come to sales depôts, has not been treated as assets at close of the year. The operations of the year may consequently be regarded as having resulted in an actual profit of a lac of rupees in round numbers.

C. F. AMERY, *Dy. Conservator,*

for *Conservator of Forests, Punjáb.*

APPENDIX A.

REPORT ON THE TRANSFER OF RUKHS.

The Report is divided into three parts.

I.—Details the transfers as regards area, &c.

II.—Is concerning the question of cultivation, minor forest produce and grazing.

III.—Gives details of establishments.

2. The general orders for the transfer of rukhs are contained in the Government letter No. 425, of 3rd June 1870, and the details in the Financial Commissioner's letter No. 3720 dated 24th June 1870.

3. The rukhs have been arranged in Divisions :—

CENTRAL DIVISION.

1 Deputy Conservator and 1 Assistant.	Lahore. Gujranwalla. Montgomery. Amritsar. Goordaspoor cheel tracts (included as a a matter of convenience).

MOOLTAN SUB-DIVISION.

1 Assistant Conservator or Forest Ranger.	Mooltan. Mozuffurgurh.

NORTHERN SUB-DIVISION.

1 Assistant Conservator with 1 Forest Ranger.	Gujrat. Jhelum. Shahpoor. The Kachhi Forests.

4. If the Derajat Rukhs are to be transferred they will form a Forest Division, and in that case a new Assistant Conservatorship must be created, for it is perfectly impossible to work the Central Division without an Assistant to help the Deputy Conservator, who will have to maintain a general superintendence over other divisions also.

5. *Central Division.*—The transfer of Lahore was made late in the year, but was agreed to have effect from the 1st April 1870, the date referred to in the transfer orders.* The whole of the rukhs on the register have been made over without exception. The military rukhs still remain under the control of the cantonments, to the great inconvenience of the people and to the serious loss of Government.

* See Deputy Commissioner to Conservator's No. 1827, dated 3rd November 1870.

6. *Gujranwalla.*—All the rukhs are transferred except a bare plot called "Meei-Misnâmi," which had better be sold. We would gladly have restricted ourselves to a closer area in this district, but unfortunately every tract of land near the Grand Trunk Road had been sold or granted away in former years, and there is nothing to do now but to secure the more distant 'bar' rukhs, and the few tracts that still remain as outliers. I believe that ultimately it will not only be necessary but profitable to run a tramway across the district to the bar rukhs for railway fuel.

7. *Amritsar.*—All the rukhs here are transferred, but amount only to 1,602 acres, exclusive of Serai Amanut Khan, which has been treated as a plantation (the register of these rukhs is in Financial Commissioner's Office).

8. *Montgomery.*—In my No. 373, dated 10th August 1869, I reported to the Secretary to Government the first transfer of the selected area, which contained about 59,300 acres, and a list of the tracts was given. The selection was, however, not a very happy one. In this office No. 66, dated 7th April 1870, I reported the formerly arranged transfer of acres, 55,760 in 1869, and a further area of 1,278,533, and gave lists.

9. It was, however, clear that so large an area could not well be managed. Accordingly the Deputy Conservator of Montgomery, Mr. Browne, and I, met in conference, and agreed to recommend for sanction certain proposals. I have only modified the proposals as regards the final area of transfer, which now stand as below. The terms are—

(*a.*) That the Department reserve only the rukh area from the north side of the Railway line up to the Ravi, and also five tracts trans-Ravi, *viz.*, No. 25 in the Gugaira Tehsil, and Nos, 55, 56, 57 and 58 in the Montgomery Tehsil, the whole forest area being just about 500,000 acres.

(*b.*) The reserve will be divided off into 7 or 8 blocks, according to the natural divisions effected by certain main roads, these will be leased by the District Officer along with all other rukh lands of the district as regards grazing ; and such leasing will include the "Sajj," "Kokan Ber" and "Gul Kesu," which last are trifling items not worth saving. The proceeds of these tracts will go to the Forest Department.

(*c.*) In all other respects the entire management of the reserved tract will rest with the Forest Officer, who will carefully preserve it, divide it into convenient protective beats, and arm the protective officers with powers to grant at once the small local demands for wood (on a system similar to that in the Rawulpindee forests), and thus provide for the public convenience.

(*d*). All "kâsht baráni" or casual cultivation in the reserved tract will be permitted by and managed by the Forest Officer, if at all.

(*e*). It will be arranged that out of the seven or eight blocks above alluded to one at a time shall be preserved for three years against camel-grazing; then it will be opened and another closed. Whenever the Forest Department, having cleared a tract for fuel for the Railway, &c., wishes to reproduce that tract, it will ordinarily enclose it with a thorn hedge or otherwise, and keep out grazing altogether, paying compensation, where necessary, to the lessee. As, however, about 2,000 to 5,000 acres only are cleared at a time, and the blocks will be upwards of 50,000 acres, the closing off of a small portion will not practically lead to any difficulty.

10. A copy of the conference note is appended. I trust the Financial Commissioner will agree to this simple and satisfactory arrangement. An European Assistant will be stationed in the district for the greater part of the year.

11. For the *present* year, as the leases cannot be re-arranged on the above principle, it is agreed that we are to have, from the grazing proceeds, a sum equal to the estimated area of the reserve credited to us; this can of course be easily ascertained, and it will merely require an order of the Financial Commissioner to enable us to arrange it.

12. All other matters agreed (except this leasing of tracts) will take effect at once.

13. *The Mooltan Division—Mozuffergurh.*—Anything more objectionable in a forest point of view than the present alteration of cultivated and forest land cannot be conceived. The map enclosed (No 1), though certain to be wrong in details, shews sufficiently what an inextricable confusion there is. No sooner had we taken over (as reported in 1869) the 125,668 acres allotted to us, boundary disputes arose on all sides, and there was nothing to do but to get the District Officer to settle all these, and 53,000 acres have actually been completed in survey. The selection is a very bad one, however, and I *propose* to retain during the year only the 53,000 acres actually settled *until the 1st April* 1872, by which time I expect the following arrangements will have been carried out, *viz.*, that the rukh land contained in a strip extending to 10 miles inland (and no further) from *either river* be the first *surveyed*, and all boundaries settled and declared reserved rukh, and on the 1st April 1872 thus be definitely transferred to this Department. No cultivation to be allowed within the rukh lands, and the existing cultivation to be so dealt with by aggregation and otherwise as to secure the reserved rukhs in definite, and, if possible, compact blocks along the rivers, just as rukhs Nos. 13, 1, 38, 27, 10, 15, 5, 4 and 17 (for instance) now are, and excluding from reserve every thing else. No district rukh establishment will then be needed, only a grazing establishment. During the present year the Forest Officer will only claim the income and control of the 53,000 acres and pay the establishment as heretofore, but will visit the rukhs and help the Deputy Commissioner in the survey of such tracts as he may be directed. I hope I have made this definite.

14. *Mooltan.*—No further transfer has been made than that reported in 1869 of 59,388 acres. This I wish to manage during the year, allowing no cultivation but what we ourselves arrange for under circumstances which I shall describe presently under Head II., Cultivation. At the same time preparations for a better selection must be made. I had *hope* that such selections would (as I before reported) have been done by now; but the extent of survey and certain difficulties about the transfer of an officer, which need not be detailed, rendered it impossible, but by 1st April 1872 it can be arranged. Then for the present official year 1871-72, the status is—

Area of 59,388 *reserves* to be managed by this Department, and nothing else.

Survey operations to progress in this district, the forest future of which is likely to be important, so as to make ready for transfer to the Forest Department on 2nd April 1872. A finally reserved tract to include all *valuable woodlands* as follows:—

North.—Within 10 miles of both banks of the Ravee, and of the south bank only, where but one bank is in the Mooltan District.

Central.—Within 10 miles of either side of the Mooltan line, where there are tracts worth having—

Do. Indus Valley line.

South-east.—Within 10 miles of the north-west bank of the Sutlej.

West.—Within 10 miles of the east bank of the Chenab.

All other rukhs to be unreserved.

15. So vast is the area of rukh land in these districts that it is apprehended that, after allowing for all waste area attached to villages, there will be an amply sufficient area of rukh land to be reserved. The conditions will be as in Mozuffurgurh. No cultivation is to be allowed except under orders of Forest Officer.

16. These limits will probably include the existing reserves; if any are beyond them they may lapse to unreserves.

17. Henceforward the surveys must be directed in these lines.

18. After very careful consideration I have come to the conclusion that it is useless for this department to try and conserve anything in Jhung at all, and beg leave to give up everything here. Money spent on conservancy will be, I believe, wasted; the time has not come when a regular establishment can be afforded, and to protect a vast area of bar by a few men is more waste. The Mooltan officer had much better devote a really efficient superintendence to the two districts of Mooltan and Mozuffurgurh, than divide his attention over three districts, one of which does not appear likely, for many years to come, to yield any supply that can be useful at Mooltan, or for use even by the steamers.

19. Reviewing then the state of this Division, we have—

Mozuffurgurh.—No new control by this department till 1st April 1872.

Mooltan.— Do. Present reserve maintained and more to be ready on 1st April 1872.

20. Proceeding now to the Northern Sub-Division.

Gujerat is transferred entirely with all belahs along the river.

21. *Jhelum.*—The rukhs to be taken in this district are those colored green, brick red and purple (see at page 7 of the printed correspondence, paras. 17, 18, 19 of Colonel Bristow's report). But there is no object in our taking care of *all* the outlying rukhs. A glance at the map shews a road turning south from Tallagang past Jhatla Khichee and Chinjie. This should be our *western* boundary. There is only one outlying rukh of Máree, which is a compact block and should be preserved.

The *north* boundary should be the road from Tallagang to Chakowál, and thence to the edge of the Diljabba rukh, whence the boundary would run north-east along the edge of the Diljabba and Neelee rukhs. The river Jhelum forms, of course, the south-east and south-west boundary throughout.

22. Unfortunately, as indeed in other questions connected with these rukhs, the decision arrived at as regards rights is unsatisfactory. It was said by Colonel Bristow, who evidently understood the subject, that these rukhs so colored were the *absolute* property of Government; that is clear, and consequently there was no objection to excluding grazing if necessary. It was, however, decided that villagers (which it is important to notice, have ample area of waste land of their own *besides*) were to graze as they pleased. Here is an important right of Government given up without any reservation. The paragraph on this subject is also unsatisfactory (*vide* para. 5 of the Commissioner's letter); for if grazing is a *right* as the Commissioner calls it, it was not in his power either to recommend its continuance or otherwise; but if it was a *privilege*, the discontinuance of which was politically undesirable, this should have been said; it was, however, unwise not to reserve the right of protecting certain parts and imposing a "thák."

23. This matter is of the highest importance. Many of these rukhs have been cut for the Northern (State) Railway, and they actually *must* be closed against grazing for the next *few* years, otherwise reproduction will be impossible. The more bare these hills are, and the more the danger of denudation presses, the slower is the rate of reproduction, and the more absolutely needful is the power of excluding grazing from certain portions.

24. The question of arranging cultivation blocks (*the most* obnoxious form of forest encumbrance with which I am acquainted) has been equally unsatisfactorily disposed of; and cultivative plots, whatever their origin, are allowed for the term of settlement, which practically means for ever—(*vide* para. 5 of the Commissioner's letter.)

25. At present the status of the rukhs is proposed to be defined in the following extra ordinary language:—

"The rukhs to be (not *are*, as if property could be created at will) the absolute property of Government for the protection of the trees, &c., but the villagers to retain the customary right of grazing plough cattle on payment of a small due to maintain a protective establishment for each rukh."

26. To say that a thing is the *absolute* property of Government for a strictly *limited* purpose is a direct contradiction in terms; and the purpose, limited as it is, is next rendered almost impossible of exercise by the creation of an universal grazing right for plough cattle, and not only so, but Government is not allowed even to devote the proceeds to its own use, but is bound to use them to maintain an establishment *for each* rukh. And all this restriction gratuitously created, Colonel Bristow declaring the *right* of grazing not to exist.

27. Such is the way in which forests and forest rights have too often been treated in past years. *Right* is a word which has apparently lost its meaning. The rest of the rukh rules at page 11 of the correspondence are no less objectionable; they do not, however, concern my present subject, which is merely to shew that there is no reason for allowing *indiscriminate* grazing, and that, therefore, if these Jhelum rukhs are to be properly managed, grazing *must* be excluded from such of the reserved tracts as the Forest Officer, after careful visiting, shall declare necessary.

28. I am aware that any dealing with cultivators will now be very difficult, and I shall not therefore suggest any alteration, reserving to myself to make a special reference in case

in any particular plot the suppression of cultivated area seems more than usually desirable. No establishment will be needed by the District Officer; but of this hereafter.

29. *Shahpoor.*—I had hoped that the forest in the plains (as distinct from the Salt Range rukhs) would have been visited, but I am sorry to say that the difficulties of the Northern Railway fuel-supply and other matters prevented it being done, though I am bound to say that Mr. Murray, the officer in charge of this Division, has not shewn the energy or the care in visiting his rukhs that he ought to have done.

30. At present, therefore, the transfer of the Shahpoor rukhs is limited to the fourteen Salt Range rukhs enumerated in the printed correspondence.

The rukhs in the plains may as heretofore remain for this year without any establishment or conservancy, and during the year a limited area of rukhs along the rivers and the border of the Jhung District nearest the Sutlej and nearest the Jhelum might be reserved, say within a distance of 10 or 15 miles. The rukhs so reserved should be treated by *lease* as regards grazing, and cultivation kept out, camels also.

31. The 2nd class Rawulpindee rukhs not being in this division but belong to the Jhelum Forest Division, it is for departmental considerations necessary to make these transfers matter of separate report.

32. All the areas selected are now being entered on detailed registers, most of which will be in my office before long.

33. The maps and statistical information to be collected as described in the memorandum on rukh transfers submitted with my No. 910, dated 30th January 1871, will be gradually got together.

34. I have all the materials ready, the maps, &c., of one of the districts (Gujranwalla), and shall hope very shortly to shew you one of the complete rukh volumes as a specimen of what all will be when compiled, but I need not say that the collection of this information in every district is a matter of time and will be accomplished gradually. The registers are of course first taken in hand, and even should all the columns not be filled in at once, the names, number, situation and area of each rukh is recorded. There are, as you are aware, already existing registers, and mine are merely *revised* copies, eliminating rukhs struck off the roll or unreserved, and adding certain other information in a tabular form (the form has been submitted to you).

Part II.—Cultivation and Grazing.

35. The present status of cultivation is as follows:—In Lahore rukhs some of the land is let on long leases, others for yearly leases, proceeds going to the district.

36. *In Mooltan and Mozuffurgurh.*—In the reserved rukhs no leases are given, but when there is a good rain-fall people apply for permission to cultivate and get it for one crop only the Deputy Commissioner giving such permission and taking the proceeds.

37. In Gujranwalla there is no cultivation in rukhs.

38. In Gujrat there appears to be cultivation by yearly leases, going to the district.

39. In the Pubbi hill rukhs, however, I should invite your attention to the cultivation, here the people cultivated without any right at all, and instead of being turned out, the cultivation was left alone, and a certain share of the proceeds taken. Now this large Pubbi tract is so far a very valuable one as it is available for the Northern Railway supply, and I have therefore to make proposals about this cultivation, because the people have seized on the best bits of the rukhs. The best thing will be to give them notice that at the end of two years they will be required to give up the land, and I would let them have it rent-free for those two years, conditional on their having sown over the land ten feet apart young phulahi and kikar trees; the details of such a scheme can easily be settled.

40. *Of Shahpoor.*—I have nothing to say till I make definite proposals for reserve of certain of the *bar* rukhs, which I shall then request to be free of cultivation, but I do not think there is any in the localities.

41. As regards *Jhelum* cultivation, I have already said all I can on the subject in para. 26.

42. From a consideration of the existing status, I have deduced the following observations. As a general principle, it seems to me highly undesirable to extend *casual* cultivation in rukh lands, except when it is done further directly for forest purposes or from motives of public convenience.

43. It is true that the rukh area in the district is enormous, even that transferred to the Forest Department as a reserved area represents *probably* in most districts, *certainly* in some, a far larger area than need ultimately be retained as forest area, and it will be one of our first duties so to understand the capabilities and situation of the rukhs as to be able to say readily what area may without risk be given up gradually to be *bonâ fide* and recommended applicants. It is certainly impossible for any one to fix the *ultimate* area which will be reserved permanently as forest until the period of rotation for felling these coppice woods is accurately known, and until a valuation survey of them has been made, the lines of export ascertained, and the annual demand and yield ascertained.

44. But there are very few districts in which the rukh area is so reduced as not to leave it certain that a considerable area may be brought under cultivation, and accordingly

while a large tract of *prima facie* reserve (if I may use the expression) is set aside, cultivation should be encouraged to the utmost elsewhere, and money spent on forest conservancy (as distinguished from the preservation of single trees and clumps of trees about the country), would be thrown away. Still it is not by *casual* cultivation *within* rukh areas that any good is done or any progress towards reducing the total area of waste land is made.

45. I am of opinion that wherever in existing rukhs there is land which is on any lease longer than five years, or granted on any terms, it should at once be excluded altogether from the rukh accounts and the proceeds all go to land revenue. After eliminating those lands, and, *if possible*, making arrangements to aggregate them to one corner, or otherwise, so as to allow a clear boundary line to be drawn between them and the forest area, no cultivation should be allowed in the rukhs, under the management of this department, but such as the Forest Officer may allow, and which he will manage, and which will have no connection with the ordinary land revenue at all.

46. In many cases we find it absolutely beneficial to the soil for it to be cultivated for a year or two; in other places we have found it easy to make leases on such terms, that on the expiry of the lease the land is to be handed back planted with rows of trees or trenched for sowing.

47. In all our plantation lands, for instance, the officer in charge obtains a large portion of his work in trenching done by short leases on these conditions; but it would be extremely inconvenient if merely, because there *was* a lease of land, the matter should be excluded from his control, or the lease proceeds go to land revenue.

48. In forest land, too, the Forest Officer's control is interfered with if leases were granted without his consent, and if all yearly leases had to be arranged by a correspondence, time would be wasted; it is far better to recognize that there is no cultivation in forest lands (than already let out for long terms, being excluded from the term rukh lands, as before suggested), the Forest Officer allowing it on short lease only where conducive to the objects of foresting, or otherwise unobjectionable. As the Forest Officer has his special duty in moving about among his rukhs and seeing to leasing of grazing, &c., himself, instead of leaving it to the influence of native subordinates, much fairer sums are obtained and much fraud and connivance prevented, and no possible objection can be raised to his management of such matters on the score of inability.

49. I take this opportunity of expressing a hope that this source of income to the State in lands not included in rukh area or struck off such area on account of the desirability of allowing cultivation then will receive attention. I have specially addressed the Deputy Commissioner of Lahore on the subject in my letters No. 8, dated 5th April 1871, and No. 68, dated 13th April.

50. I know a plot of rukh land now which is nearly all leased out; it should be struck off the rukh register, but Mr. Browne assures me the leases would fetch far more than at present. For some years past the land has been leased at about Rs. 4. per acre. We are well informed that the lessees realize Rs. 46 to Rs. 50 on it. If put up to auction the annual leases would realize Rs. 15 or Rs. 20 at the least. I purposely avoid giving the name, as the instance is intended only as an illustration.

51. One great good will at any rate result from the rule that the cultivation in rukhs (kept as such) is prohibited except under circumstances where the Forest Officer may desire to allow it, will be that this species of encroachment will be impossible until the time comes where Government really wishes to *reduce* the rukh area Let all lands that are on long leases, or that have been so cultivated and improved with wells, &c., as to be like regular village lands, be dealt with on their own merits, and if it is not desired to remove the people, strike the area out of the rukh altogether.

52. On this subject no doubt the existing rukh registers do give a certain area as "cultivated," but none of them specify whether the cultivation is casual, or for how long, or whether in case of annual leases, the circumstances are such that it is considered undesirable to turn out the cultivators. I think, therefore, that it is now desirable that each District Officer should make a report on the cultivated lands included in the rukh area of his district. Let all lands that cannot be fairly left as rukh land, and on which cultivation cannot cease on expiry of the current year's lease, be at once struck off the rukh registers and brought on to the list of revenue-paying lands under district control. All rukhs will then be on a satisfactory basis, and if cultivation is allowed by the Forest Officer for any special reason as before intimated, he will be responsible for it and take the proceeds under one of our miscellaneous receipt heads.

53. Lastly, in this subject it is desirable to lay down a definite procedure for application to get sale grant or long lease of rukh land, which would have the effect of excluding such land from forest area altogether. At present persons sometimes apply to the Forest Department first and sometimes to the district.

54. In my opinion, it would be better to prescribe that, persons intending to apply for lands in area which are at present *reserved*, should apply first to this Department, specifying the area and situation. This Department having certified, in a forest point of view, the grant or sale or lease of the land is unobjectionable, the applicant could carry up to the District Officer a copy of such report, and then the question whether the applicant is deserving or eligible, &c., &c., would be decided by the District Authorities.

55. The Forest Officer's opinion should, as a matter of course, be entirely confined to whether, in a forest point of view, the land can be given up. As to whether the applicant is deserving or whether the quantity he asks for is reasonable in itself, are matters which this Department cannot and ought not, even if it could, to judge.

56. As to the adjustment of other items. All minor produce, limestone, gums, 'chichra' leaves, soda burning, &c., coming from transferred rukh should belong to this Department, unless, as in Mooltan Division, they cannot be conveniently separated from the grazing leases, in which case they follow the latter.

57. As to grazing, it has already been generally agreed that the grazing income from transferred rukhs belongs to this Department. There is always good grass with the wood, and it is a most fair place to allow the minor forest produce to compensate in some degree for the outlay on wood conservancy which will generally be for some years to come expenditure only.

58. In all those districts where the "rukh system" is in force, this Department has special facilities for arranging the leases, so that no question can arise; but in the Mooltan Division I hope that you will permit the question to be settled beyond disputes, by laying down that the income of the transferred tracts is under any circumstances to go to this Department.

59. During the year past much correspondence has arisen owing to the rule that we were not to get "tirnee." Opinions seem to differ as to what tirnee is, and this restriction was so interpreted by some officers as to give the greatest difficulty.

60. In Montgomery it will be observed the Deputy Commissioner has proposed a definite and simple scheme. For the other districts of this Division the area transferred to us is known, and I see no reason why the District Officer should not arrange the grazing of his whole district, including the grazing of our blocks, and let us have the income. If he incurs any expenditure in recovery of the grazing, the Forest Department should pay that expenditure, where known, according to the blocks, or a fair portion of the whole expenditure proportionate to the transferred area he has. I should be much obliged if you would let this be the future rule in supersession of former ones. Any tract that I wish to close against grazing I will duly notify to the District Officer before the beginning of the year.

61. It is absolutely necessary that the income derived from every tract kept as a *forest* should be shewn as forest revenue, because otherwise it is impossible to obtain a hearing when any establishment question comes up; the income of that tract is looked to, and if it is not credited the most necessary establishment runs a great chance of being negatived, and this affects not only this one Division, but the totals of the whole Department.

62. In future years, when in Mooltan and Mozuffurgurh the selection of the reserved and compact rukhs has been made, it will probably become easy to abandon the tirnee system and lease them, and that can be done by our people; but whether this is so or not, I think the grazing might come to this Department when the tract of land does.

63. As regards the collection of all outstanding dues, I beg to suggest that it should be on the same footing exactly as the canal or any other revenue, in case balances are due; the officers of this Department have no Revenue powers and consequently we should certify the balance due as the Canal Officers does, and the Revenue Officers might realize it by the summary process for which they hold authority. This system has been most successfully and harmoniously followed in the Montgomery District last year. Whenever there was a balance which some one would not pay up, it was certified to the District Officer and recovered.

PART III.—ESTABLISHMENT.

64. I now proceed to introduce the revised scale of rukh establishment in a series of lists for each District. Even in those few districts where the final selection has (in accordance with the above) yet to be made, the general divisions of the country and rukhs are well known, and a portion of the establishment actually provided for. For the final number of beats or watchers' charges, an estimate has been made, which may, however, be relied on.

65. These lists it will be observed show the area of rukhs in charge of this department as well, whenever these are known. I have given no list of Shahpore, because I am not in a position to give details of beats, &c., but the district establishment will suffice. Pindee is separately reported on, and I only include in my abstract that part of the establishment which comes from rukh establishment sanction. The Murree and Kabuta forests, hitherto under management, had establishment in the Forest Budget.

66. I must, however, exhibit in a more brief form the general results. In the first place the rukh establishment in the districts (exclusive of European Officers which have been separately sanctioned) was sanctioned (Resolution 274F., dated 22nd August 1868,) at Rs. 45,504 per annum. But of this the following divisions have not been transferred to this department:—

Delhi	Rs.	408
Jullundhur	„	2,760
Derajat	„	4,224
Peshawar	„	1,716
Total,	Rs.	9,108

So that the present establishment sanctioned for *those districts in which this department has supervision* is Rs. 36,396 ; or, excluding the salary of Mr. Browne, &c., (which was included in the sanction of those days and comes to Rs. 8,280), we have Rs. 28,116 per annum.

67. The establishments for the rukhs now transferred are fixed, after careful consultation, as follows :—

Lahore	...	...	...	Rs. 420	per mensem.	
Amritsar	...	...	...	„ 45	„	
Gujranwalla	...	...	...	„ 250	„	
Montgomery	...	...	...	„ 270	„	
Multan	...	...	...	„ 225	„	(Estimated.)
Mozuffurgurh	...	...	...	„ 175	„	„
Rawul Pindee	...	...	...	„ 216	„	*
Jhelum	...	...	...	„ 400	„	
Gujrat	...	...	...	„ 190	„	
Shahpore	...	...	...	„ 200	„	

Total, Rs. 2,391, or per annum Rs. 28,692 (established.)

68. This therefore is in excess of the present rukh establishment, and is still more so because *some* district establishment will have to be maintained. This I now proceed to.

69. In Lahore, Amritsar, Gujranwalla, Gujrat and Shahpore the whole rukh establishment comes to this department ; in the case of the last-named district it is the whole, because the bar rukhs not transferred will have no establishment.

70. In the following districts, Montgomery, Multan, Jhung, Pindee and Jhelum, it is a matter of question whether district establishment need be maintained on such rukhs as have not been thought suitable to conserve by this district. It will be observed I speak of *rukh* establishment as *distinct* from tirnee or other grazing establishments. In Montgomery I should say, yes : there are Shesham groves and certain other tracts which for the present may be more conveniently looked after by the District Officer, and a small establishment, say of Rs. 50 a month, will suffice.

71. In Multan and Jhung, in my opinion, there is really no use in trying to conserve any more forests than that taken up by this department ; the same in Rawul Pindee. There are grazing establishments, and these can do the little that is needed. Whether a small establishment will be required for the untransferred parts of Jhelum, I cannot say ; probably a few men will be desirable.

72. I do not intend, however, that the excess shown by me should be occasion for any extra want, because I can adjust the matter in connection with general forest establishment grants, and leave even a margin for the small district establishment required.

73. The distinctive feature of the establishment now proposed is, that every man has a distinct beat, and in that beat, an official residence, so that every one knows exactly what his sphere and what his responsibility is.

74. The lowest item is the " beat " guarded by the lowest class of protective officer ; a number of beats united form a " range," presided over by a " Forester " or " Forest Ranger" as the case may be. When the ranges are large or valuable under the Forester in charge, persons are put in charge over a sort of sub-range, or smaller aggregate of beats.

Note of Conference with Deputy Commissioner, Montgomery, and B. Browne, Esq., dated 10th April 1871.

It is agreed—

I.—That the whole Government waste land between the north side of the Railway line and the Ravi river be made over to the Forest Department. Also the plots Trans-Ravi Nos. 55, 56, 57 and 58, in the Montgomery Tehsil, and plot No. 25 in the Gugaria Tehsil. All the rest to be given back to the District Authorities.

II.—The existing Jangul Mahals all over the district will be maintained ; but for the purpose of annual sales they will be thrown together in groups of five or six, so that the boundaries between the groups or plots may be thoroughly and permanently defined by the river, the old beds and the main district roads ; about 7 or 8 of thess plots will be under the Forest Department.

III.—The annual sales of tirnee and of all miscellaneous jungle produce, wood excepted, will be made by the District Authorities ; but in the plots belonging to the Forest Department, such conditions will be insisted on in making the sales as the Forest Department may think fit. Probably one plot will be reserved from camel grazing entirely, for three years at a time. The conditions should be notified to the District Authorities before the 1st March every year.

IV.—The sale of timber in the plots made over will rest entirely with the Forest Department, who intend making arrangements to supply wood that may be required in the neighbourhood by the villagers and the Local Authorities.

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* Exclusive of the Murree and Kabuta forests, which are otherwise provided for as *Forests*. No. list of this is sent because of the separate report.

V.—The preservation and sale of wood beyond the limits above indicated, will remain with the Local Authorities. The chief portion of the existing District Forest establishment will be made over to the Forest Department or reduced, but one Naib-Darogah and a few chaprassees will be retained, and probably amalgamated with the Tirnee establishment.

VI.—In the plots made over to the Forest Department the District Authorities will have *nothing whatever* to do with "kasht barani" or annual cultivation. Nor will they take the initiative in the case of permanent sales or leases, except where the Local Authorities are themselves the applicants for the land. All other applicants will apply first to the Forest Department, and the Deputy Commissioner will not interfere till the Forest Department has decided on granting the lease. Of course the Local Authorities may give advice or give a letter of recommendation to any applicant. The Forest Department having decided that a lease may be given of particular land in their plots, and having assessed the standing timber, will forward the application to the Deputy Commissioner for final arrangements. On the other hand, beyond the limits above indicated, the Deputy Commissioner will have the *entire* management both in annual and permanent lease.

VII.—The whole income of the Government waste land, whether forest or district, will be paid into the district treasury. The *whole* income of every kind (tirnee, &c., included) in the forest plots will be credited to the head "Forests," and the whole income of every kind (wood included) in the waste, not made over to the Forest Department, will be credited to "Miscellaneous Land Revenue."

VIII.—When selling standing timber in land not included in the the forest plots the Deputy Commissioner will make his own estimate. He may of course ask the advice of the Forest Department, and the latter may give such information as it can.

IX.—The leases made for the present year will not be interfered with, but it seems desirable that all the other arrangements detailed above should commence at once, and that the income of the forest plots for the current year, as approximately determined, should be credited to the head "Forests."

LAHORE DISTRICT.

District charge.	Name of range.		Beat.	Acreage.	Official in charge.
1 Forester, 1st grade, Rs. 40 (over the whole district).	Range "Lahore and Kasoor," (no one over the range, but two men over each half formed by the road to Ferozepoor.)	1 Forest watcher, 1st grade, Rs. 10.	No. 1 Basseen ... / Tulsipur ...	1,233	1 Forest watcher @ Rs. 6
			" 2 Padri ... / Dahure ...	1,341	1 Ditto " 5
			" 3 Tera ...	5,197	3 Ditto " 5
			" 4 Bangali ...	7,489	2 Ditto " 5
			" 5 Barkuntha (to look after Dhalla also),	4,478	2 Ditto " 5
		1st grade Forest watcher Rs. 10, residence Kot Lukput.	" 6 Korutana ... / Faizpur ... / Jhok ...	3,313	1 Ditto " 6
			" 7 Kot Lakput ...	3,973	2 Ditto " 6 (exceptionally valuable.)
			" 8 Chandran ...	1,851	1 Forest watcher @ Rs. 5
			" 9 Lakhowal ... / Sultanke ... / Shekh Kot ...	1,590	1 Ditto " 5
			" 10 Khana Nepal ... / Rana Chedu ...	920	1 Ditto " 5
			" 11 Ladheki ...	2,193	1 Ditto " 5
	Range Chunian east (up to road leading to Bhai Peru). 1 Forester, 6th grade, Rs. 15.		" 12 Paji ... / Raiwind Jadid ...	1,100	1 Ditto " 5
			" 13 Madki ... / Butt ...	1,555	1 Ditto " 5
			" 14 Bail Bachoki ...	4,468	1 Ditto " 6
			" 15 Chichor ...	4,970	1 Ditto " 6
			" 16 Turhwind and Paimas,	5,371	1 Ditto " 6
			" 17 Chulak and Rawal Jhangar ...	2,914	1 Ditto " 5
			" 18 Dhala and Nol ...	5,764	1 Ditto " 5
			" 19 Shah Iinayat ...	2,344	1 Ditto " 5
			" 20 The Duhli ... / Dhig ... / Mandheki ...	4,022	1 Ditto " 5
			" 21 Keh Daleki ... / Changa Manga ... (North of Railway.)	5,362	1 Ditto " 5
			" 22 Bagiana ...	4,903	1 Ditto "
	Range Chunian, west. 1 Forester, 6th grade, Rs. 15.		" 23 Thatti Awal ... / Duain ...	1,712	1 Ditto " 5
			" 24 Theh Sech ... / Buneki ...	3,110	1 Ditto " 5
			" 25 Bairwal ...	4,755	1 Ditto " 5
			" 26 Guman ...	7,646	1 Ditto " 6
			" 27 Halla ...	6,082	1 Ditto " 6
			" 28 Naloki ...	1,924	1 Ditto " 5
			" 29 Theh Russa ...	6,935	1 Ditto " 5
			" 30 Chunyan ...	1,778	1 Ditto " 5
			" 31 Shamsabad and N. S. Deooyal ...	6,415	1 Ditto " 5
			" 32 Wan Radha Ram ...	9,424	2 Ditto " 6
			" 33 Wan Rai Pathoki or Mopal ...	17,621	2 Ditto " 5
			" 34 Hunjr Wall ...	6,858	1 Ditto " 5
	Range "Trans-Ravee." 1 Forester, 4th grade, on Rs. 25.		" 35 Dhanoa ... / Awan ...	717	1 Ditto " 5
			" 36 Baoli Lehna Singh,	10,917	2 Ditto " 5
			" 37 Kuttala ...	9,518	2 Ditto " 5
			" 38 Ellarh ...	4,573	1 Ditto " 5
			" 39 Khaira ...	2,664	1 Ditto " 5

LAHORE DISTRICT.—*(Concluded)*

District charge.	Name of Range	Beat.	Acreage	Official in charge.
	Range "Trans-Ravee." 1 Forester, 4th grade, on Rs 25.	No. 40 Kalpi and Kampi...	3,162	1 Forest watcher @ Rs. 5
		„ 41 Mah devi ...	15,673	1 Ditto „ 5
		„ 42 Malikpoor ... / Mah Dodei ...	4,640	2 Ditto „ 5
		„ 43 Thatta Chur Shah, and Kanjrewalla...	1,682	1 Ditto „ 6
		„ 44 Bhagtera ... / Ratuana ...	4,221	1 Ditto „ 5
		„ 45 Bhagaur ...	10,746	2 Ditto „ 5
				56
		Add 3 Forest watchers to attend on the Forester ...	...	3
			...	59

ABSTRACT.

1	Forester, 1st grade, @ Rs. 40	... ... Rs.	40
1	Ditto, 4th „ „ 25	... ... „	25
2	Ditto, 6th „ „ 15	... ... „	30
2	Forest watchers, 1st grade, 10	... ... „	20
49	Ditto, „ 5 each	... „	245
10	Ditto, „ 6 „	... „	60
		Total, Rs	420

N. B—Rukhanwallee and Vegal are purposely excluded as likely to be at once sold or granted.

AMRITSAR DISTRICT.

District charge.	Range.	Beat	Acreage	Forest official in charge.
1 Forester, 5th grade, on Rs 20.	Amritsar.	No. 1 Bahurú ...	556	1 Forest watcher @ Rs 5
		„ 2 Palasaur ... / Sheikh Futta ... / Dinawál ...	286	1 Ditto ditto 5
		„ 3 Sharon Osmán ...	110	1 Ditto ditto 5
		„ 4 Gagrawál ...	556	1 Ditto ditto 5
				4
		Add one watcher to be with the Forester ...		1
				5

ABSTRACT.

1	Forester, 5th grade, @ Rs. 20	... ... Rs.	20
5	Forest watchers, @ „ 5 each	... „	25
		Total, Rs.	45 per mensem.

GUJRANWALLA DISTRICT.

District charge.	Range.	Beat.	Acreage.	Official in Charge.
1 Forester, 1st grade, Rs. 40.	"Range Goojranwalla," looked after by the District Forester.	No. 1 Kikranwallee ...	576	1 watcher on Rs. 6 exceptionally valuable to be planted.
		„ 2 Chichranwallee ...	1,322	1 watcher @ Rs. 5
		„ 3 Sanawallee ... / Dúní Chund ...	656	1 Ditto „ 5
		„ 4 Baolie Akalgurh ...	626	1 Ditto „ 5
	"Range Hafizabad," 1 Forester, 4th grade, Rs. 25.	„ 5 Kamanwallee ...	5,216	1 Ditto „ 5
		„ 6 Gadranwallee ...	6,144	1 Ditto „ 6
		„ 7 Kamalwallee ...	4,542	1 Ditto „ 6
		„ 8 Karkan ...	5,787	1 Ditto „ 6
		„ 9 Túlawállee ...	5,077	1 Ditto „ 6
		„ 10 Malyáná ...	6,091	1 Ditto „ 6
		„ 11 Langar ...	5,118	1 Ditto „ 5
		„ 12 Ruk Jibi ...	5,721	1 Ditto „ 5
		„ 13 Gajíana ...	5,332	1 Ditto „ 5
		„ 14 Khinjrawallee ... / Dhában ...	10,179	1 Ditto „ 6
		„ 15 Magadwallee ... / Kothra ...	7,364	1 Ditto „ 6
		„ 16 Kotha. Moman ...	10,376	1 Ditto „ 6
		„ 17 Choranwallee ...	5,082	1 Ditto „ 5
		„ 18 Andheú ...	5,140	1 Ditto „ 5
		„ 19 Panliana ... / Rahmúana ...	8,550	1 Ditto „ 6
		„ 20 Kundianwallee ...	4,065	1 Ditto „ 5
		„ 21 Dalora ...	7,544	1 Ditto „ 6
		„ 22 Boriwalla ...	5,400	1 Ditto „ 5
		„ 23 Bajwana	5,434	1 Ditto „ 5
		„ 24 Rath ...	5,811	1 Ditto „ 5
		„ 25 Bhikolohaú ...	5,313	1 Ditto „ 5
		„ 26 Bhagawallee ...	5,183	1 Ditto „ 5
		„ 27 Hamokí ... / Karra .. / Makki ...	5,633	1 Ditto „ 5
		„ 28 Janda Jháriana ... / Mekki Umbi ...	2,256	1 Ditto „ 5
		„ 29 Wibi ... / Jandoki ... / Jhandwallee ...	1,889	1 Ditto „ 5
		„ 30 Pindí Jalol ... / Killa Ram Rang ...	2,417	1 Ditto „ 5
		„ 31 Jangla ... / Juta Muktra ... / Chah Khaili ... / Pindi Battyán ...	1,716	1 Ditto „ 5
		„ 32 Killa Murad Bux Kanchá ...	316	1 Ditto „ 5
				32
		Add 3 watchers to be with the District Forester ...		3
				35

ABSTRACT.

1 Forester, 1st grade ...	Rs.	40
1 Do., 4th „ ...	„	25
25 watchers, @ Rs. 5 each ...	„	125
10 Do., „ „ 6 ...	„	60
	Rs.	250 per mensem.

GUJERAT DISTRICT.

District charge.	Range.	Beat.	Acreage.	Official in charge.
	"Phalian." 1 Forester @ Rs. 20.	No. 1 "Muradwal Belas," *viz.*, Belas from west boundary of district to Moong ...	Uncertain ...	1 Forest watcher @ Rs. 5
		„ 2 "Moong Belas," *viz.*, from Moong to Pubbi ...	...	1 Ditto „ 5
		„ 3 (No. 11) Gohur, 2,647 ... No. 1 Bhukan, 1,862 ...	4,509	1 Ditto „ 5
		No. 4 (No. 6) Chimú, 2,560 ... „ (3) Bheki, 3,510 ... „ (2) Bachir, 470 ...	6,540	1 Ditto „ 5
		„ 5 (7 and 8) Sohawa ...	5,012	1 Ditto „ 5
		„ 6 (4) Tibitavar, 209 ... (12) Wasu, 1,147 ... (9) Shandianwallee, 569 ... (5) Tranwalla, 343 ... (10) Kalalgurh, 938 ...	3,206	1 Ditto „ 5
		„ 7.—"Phalian Belas." These vary, so that charge cannot remain the same, but the four official residences will be Burj, Gatnas, Kadirabad, Randiali and Sadallapur ...	Uncertain ...	4 Ditto @Rs. 5 each.
		„ 8 "Gujrat Tehseel Belas" ...	...	3 Ditto 5 „
	Gujerat range, 1 Forester @ Rs. 15.	„ 9 Dhul and Mari ...	1,288 and more in bela below ...	2 Ditto 5 „
	Kharianrange, 1 Forester @ Rs. 15.	10 Pubbi (to be sub-divided hereafter) ...	...	4 Ditto 5 „ 4 Ditto 6 „
		11 Belas below Pubbi ...	Uncertain ...	1 Ditto @ Rs. 6
		Add three watchers with Forester ...	Range.	3
				27

ABSTRACT.

1	Forester, @ Rs. 20	...	Rs. 20
2	Do., „ „ 15	...	„ 30
5	Watchers, @ Rs. 6 each	...	„ 30
22	Do., „ „ 5 „	...	„ 110
		Total,	Rs. 190

JHELUM DISTRICT.

District charge.	Range.	Beat.	Acreage.	Official in charge.
One Forester, 1st class, Rs. 40, charge of whole district and Tallagange range.	Tallagange range. No separate charge.	No. 1 Chirrjie ...	18,503	3 Watchers @ Rs. 5
		„ 2 Mari ...	9,438	2 Ditto „ 5
	1 Forester, 6th grade, on Rs. 15. Pind Dadun Khan's range.	„ 3 Ara ...	35,490	5 Ditto „ 5
		„ 4 Pareva and Makhula,	8,367	2 Ditto „ 5
		„ 5 Kusk and Dewan ...	6,277	1 Ditto „ 5
		„ 6 Ram Halawan and Dharm Tirth ...	2,200 (about)	1 Ditto „ 5
		„ 7 Grandhala and Dandhot ...	16,149	2 Ditto „ 5
		„ 8 Dalwal and Malot ...	9,704	1 Ditto „ 5
		„ 9 Simli ...	11,192	1 Ditto „ 5
		„ 10 Bakshiwala, Malkani, Samarkand ...	18,563	3 Ditto „ 5
		„ 11 Taliala and Daud ...	4,712	1 Ditto „ 5
		„ 12 Nurpur ...	15,026	2 Ditto „ 5
		„ 13 Sial, Jattu and Dafar,	1,591	1 Ditto „ 5
	1 Forester on Rs. 15. Chakowal range.	„ 14 Diljabba ...	4,335	1 Ditto „ 5
		„ 15 Dringan ...	6,315	1 Ditto „ 5
		„ 16 Surla ...	10,066	2 Ditto „ 5
		„ 17 Baga and Terchak ...	6,462	2 Ditto „ 5
	Jhelum range. 1 Forester, 5th grade, on Rs. 20 dmonth.	„ 18 Lehri ...	16,463	3 Ditto „ 5
		„ 19 Sagar ...	1,066	1 Ditto „ 5
		„ 20 Manki and Jindi ...	7,640	2 Ditto „ 5
		„ 21 Batali Dhora and Garar ...	3,395	1 Ditto „ 5
		„ 22 Paniala ...	1,723	1 Ditto „ 5
		„ 23 Bay samail wall and Kalian Tararan ... (Tindor and Rattaks not reserved.) ...	2,558	1 Ditto „ 5
		„ 24 Nili (to be sub-divided) ...	22,684	4 Ditto „ 5
		„ 25 Barali ...	9,155	2 Ditto „ 5
		„ 26 Wara and Pakki Khahar ...	2,009	1 Ditto „ 5
		„ 27 Kakrei and Kas Kabhi,	3,504	1 Ditto „ 5
		„ 28 Dani Dehra Bail and Pond Golundazaw,... (Nos. 22, 23, 24 need not be reserved.)	1,857	1 Ditto „ 5
		„ 29 Phudial ...	19,915	3 Ditto „ 5
		„ 30 Kandal and Nurpur,	7,411	2 Ditto „ 5
		„ 31 Tilla ...	31,388	6 Ditto „ 5
				60
		Add 2 watchers to be with Forester of district. ...	...	2
				62

ABSTRACT.

1	Forester, 1st grade	Rs. 40
2	Do., @ Rs. 15	„ 30
1	Do., „ 20	„ 20
62	Watchers „ 5	„ 310
	Total,	Rs. 400

N. B.—Nos. 4, 5, 6, 9, 10, 11, 12, 13, 14 and 15 in Colonel Bristow's list we do not intend to preserve.

MONTGOMERY DISTRICT.

District charge.	Range.	Beat.	Acreage.		Official in charge.
One Forester, 1st grade, on Rs. 40 per mensem, over whole Reserved distributed.	"Gugaira Range." 1 Forester on Rs. 20.	No. 1 Comprises Rukhs Nos. 1 and 2 ...	16,059	1	Watcher @ Rs. 5
		„ 2 Part of No. 3 ...	15,799	1	Ditto.
		„ 3 Ditto and No. 4,	23,776	1	Ditto.
		„ 4 Rukh No. 11 ...	13,899	1	Ditto.
		„ 5 Do. No. 12 ...	14,871	1	Ditto.
		„ 6 Do. No. 13 together with Rukh Magnawall	14,470	1	Ditto.
		„ 7 Rukh No. 14 and part of 15	39,680	3	Ditto.
		„ 8 Part of 15 ...			
		„ 9 Do. 15, 16 and 17 ...			
		„ 10 Rukh No. 18 and 8...	7,772	1	Ditto.
		„ 11 Do. 10, 6 and 7 ...	6,733	1	Ditto.
		„ 12 Gugaira Rukh ... Rukhs Nos. 5 and 9	13,240	1	Ditto.
		„ 13, „ 14, „ 15, „ 16 Part of Forest Rukh No. 25, including the Syadwall Rukh	81,743	4	Ditto.
	"Montgomery Range" 1 Forester, on Rs. 15.	„ 17, „ 18 Rukhs Nos. 1, 2 & 4,	24,616	2	Ditto
		„ 19, „ 20 Rukh No. 3	27,046	2	Ditto
		„ 21 Ditto 5, 6 and 8, ...	11,576	1	Ditto.
		„ 22 Ditto 7 and 11 ...	10,348	1	Ditto.
		„ 23 Ditto 9 and 10 ...	14,275	1	Ditto.
		„ 24 Ditto 12 and 14, ...	9,348	1	Ditto.
		„ 25 Ditto 15 and 16, ...	27,224	1	Ditto.
		„ 26 Ditto 17, 18 & 27, ...	18,036	1	Ditto.
		„ 27 Ditto 19 and 30 ..	11,583	1	Ditto,
		„ 28, „ 29, „ 30 Rukh Nos. 20, 21 & 22,	40.205	3	Ditto.
		„ 31, „ 32, „ 33 Ditto 58 and 57. ...	79,728	4	Ditto.
		„ 34 Ditto 56 ...	16,508	1	D to.
		„ 35, „ 36 Ditto 55 ...	27,498	2	Ditto.

ABSTRACT.

1	Forester, @ Rs. 40	Rs.	40
1	Ditto, „ 20	„	20
1	Ditto, „ 15	„	15
37	Watchers, „ 5	„	185
2	Do., for Forester in charge of district ...	„	10
		Total Rs.	270 per mensem.

ULTAN DISTRICT.

I. Range called "Ravi Range," from the north boundary of district to northern side of the Railway.

One Forester, 5th grade, on Rs. 20.

II. Range called "Railway Range," Rukhs on south side of the Multan line and along Indus Valley line.

One Forester, 6th grade, on Rs. 15.

III. Range called "Sutlej Range," Rukhs along Sutlej.

One Forester, 6th grade, on Rs. 15.

We cannot yet sub-divide these into beats, but can fairly estimate 33 watchers,—23 to be on Rs. 5 and 10 on Rs. 6,—these being attached to the Foresters.

ABSTRACT OF ESTABLISHMENT.

1	Forester, 5th grade	...	...	...	...	Rs. 20
2	Do., 6th do., @ Rs. 15 each	...	...	...	...	„ 30
23	Watchers, @ Rs. 5 each...	...	...	...	...	„ 115
10	Do., @ Rs. 6 each ...	...	...	...	...	„ 60
					Total,	Rs. 225

MOZUFFERGURH DISTRICT.

The Ranges are—

I. "Indus Range," comprising rukhs along the right bank of the Indus down as far as the north boundary of Sitpúr Tahsil.

II. "Chenab Range."—The same, but on the other side of the district, *viz.*, along the Chenab.

III "Sitpúr Range." The rukhs on the river border on both rivers in the Sitpúr Tahsil.

To be supervised by—

I.—1	Forester, on	...	...	...	Rs. 15
II.—1	Do., on	...	...	...	„ 10
III.—1	Do., on	...	...	...	„ 25
25	Watchers @ Rs. 5 each		...	...	„ 125
				Total,	Rs. 175 per mensem.

(The beats can be easily appreciated by comparing the map, but cannot be yet named and defined.)

APPENDIX B.

Progress Report of Plantation Division, 1870-71.

1. Only this last working year has seen us fairly out of the range of experiments, and we can now say that we have satisfactorily settled down to our task, knowing what we have to do and how we have to set about it.

Many mistakes have been made in the selection of land as regards sub-soil—more as regards level.

2. In several instances we were misled to cultivate only *Acacia Arabica*, seeing it grow abundantly in the fields, but in a close forest we were not quite as successful. In many cases the cost of cultivation was underestimated, and the income was often overvalued, or, at least, the time in which we could expect a return. We have become aware of the difficulty attending the supervision of small blocks, and the additional cost thereof; we have learned not to underestimate the difficulty of providing a water-supply in Canal Plantation; in short, we know now how and where to select land.

3. To have mastered at once all these details at the beginning of a new work was out of the question,—experience has been gained, and has been paid for.

4. I think I may here annex a short history,—which, however, cannot be more than a brief *resumé*,—of each of the plantations, showing the expenditure, the difficulties we have to contend with, and a short sketch of our proposed future proceedings.

5. The details will be exhibited in the working plans of each plantation. A complete plan for the Changa Manga Plantation is in the course of preparation, and will probably be finished by the end of May.

6. I shall not take the plantations according to their circles, nor according to districts, but divide them into three great classes, in accordance with the method of watering,—canal-watered plantations, sailaba plantations, and well-watered plantations.

7. Of the canal-watered plantations, Changa Manga, on account of its extent, as well as on account of its success, is entitled to the first place. The plantation can be extended to 20,000 acres, according to Joint Plantation Memoranda of 1869-70. In this case, the lines of export would be our plantation roads to the Railway Stations of Changa Manga and Rawind, and probably the canal.

8. The Officiating Commissioner, in his letter of 13th July 1864, quotes Mr. Palmer's estimate, which shows that 200 maunds brought to Amritsar by canal boat would only cost Rs. 3.

9. Dr. Stewart, in his Annual Report of 1867-68, para. 18, pronounces it to be one of the most important plantations.

10. Up to 1st of April 1867, 302 acres had been sown with *Acacia Arabica*, and 348 acres, in 1867-68, with *Acacia Arabica* and *Dalbergia Sissoo*.

11. Seventy per cent. of this area was reported as successful, and was perhaps even underestimated; but the frost blighted the great and just expectations, and all the kíkar died annually down to the roots; so that on 1st of April 1870 only a small percentage was really in a flourishing condition. The best of them were 20 acres sown on the ridge—(*see* Dr. Stewart's Report of 1867-68, para. 25). Besides these, hardly 150 acres of Sissoo, scattered about in patches and along water-courses, can be called a success.

12. In 1868-69 300 acres on the left bank of the canal escape were sown in trenches. but not more than 80 acres succeeded. Of 50 acres re-sowing, 40 acres came up well.

13. In 1869-70 the ridge system was tried on a larger scale (with 200 acres) on the Vahn road, and succeeded admirably; 190 acres of it are well stocked.

14. The system of sowing on the ridge (in German Rabattencultur) was introduced by Mr. Amery, and is now universally adopted in our canal plantations. The chief advantage of it lies in the facility of regulating the water-supply, and the water percolating through the ground does not bake and crack the surface of the soil, as by overflow, when the sun dries up the ground.

15. In the same year 500 acres were slightly trenched and sown,—cotton being sown between the lines. The cotton was sown too thickly, and the trees germinated too late. They were smothered, and the experiment proved a failure. 100 acres near the Railway Station were sown, but never watered. They did not even germinate, but perished in consequence. Seven hundred acres were trenched for last year's cultivation.

The form below will show the condition of Changa Manga Plantation on 1st of April 1871 :—

Chang Manga, 1866-70.

New land taken up.	Acres.	First success.	Re-sown.	Re-planting.	Success.	Ready for cultivation.	Remarks.
I.—Plot near Chunean Road Escape and Railway, 1866-68 ...	650	170	68/67 50	...	40	...	Too far apart, has to be intertrenched.
II.—On left bank of Escape, 1868-69 ...	300	80	150	100	90	...	
III.—On Vahn Road, 1869-70 ...	200	170	...	...	...	...	
IV.—Rest of Changa Manga, such as left bank of Escape, 1869-70 ...	500	...	...	...	...	...	
V.—Near Railway, 1869-70 ...	100	...	...	...	...	100	
VI.—On the east of Chunean Road, 1869-70 ...	700	...	...	...	...	700	
Total	2,450	420	200	100	130	800	

Total success on 1st April 1870=550 acres.
800 acres ridged.

16. In the joint memorandum of last year we proposed to intertrench 1,000 acres of the old plantation, and ridge 250 acres new land at 7½ feet apart.

17. I began with sowing only 320 acres of the 700 acres prepared in 1869-70, calculating that this would be all I could water from the Vahn weir outlet. A two-feet Mogab had been made at Gundian, but the water-courses were not ready. Of these 320 acres, 300 acres were a complete success; and, trying the Vahn water-courses, I became convinced that it would have been waste to attempt a greater area.

18. Near the Railway 100 acres were re-sown, and succeeded.

19. One hundred and twenty acres of the failures of 1868-69 were re-sown, and flourish.

20. One hundred acres new land near the Railway were ridged and sown, rather late. The plants are small, but live and grow. Six hundred and sixty acres were intertrenched, but only 200 acres could be sown, in consequence of the far-advanced season. One hundred and thirty acres of these succeeded.

Besides these, 1,400 acres of new land were trenched at 7½ and 10 feet apart, and 520 acres filled with 442,000 plants, at a cost of about Rs. 1,500, or Rs. 3 per acre. Amongst these are 36,000 toon and 4,000 *Acacia Elata.*

The transplanting has been done on prepared ridges.

21. The following table shows the work done under Heading A.VI. :—

Changa Manga, 1870-71.

Land taken up.	Acres.	Total success, 1866-70, acres.	Ridged.	Sown.	Success.	Planted.	Success.	Ready for re planting.	Remarks.
Plot I.	650	210	400 (Intertrenched.)	100	40	100	...	260	The small success is owing to the scarcity of water; transplanted only last month.
Plot II.	300	170	220 (Intertrenched.)	100	90	20	...	110	
Plot III.	200	170	...	...	...	...	...	...	
Plot IV.	500	...	300	...	...	100	...	200	
Plot V.	100	...	...	100	100	...	...	...	
Plot VI.	700	...	...	320	300	200	...	400	
Plot VIII, near Railway, 1870-71 ...	100	...	...	100	80	...	...	...	
Plot IX., Gundian	300	...	...	...	...	100	...	200	
Plot X., between Gundian and Plot VI....	800	...	...	...	...	...	...	800	
Total ...	3,650	550	920*	720	620	520	‡	1,970	

* 600 acres ridged.
† 120 ,, blank.
‡ Since writing the report, the transplants have budded, and show a complete success.

22. The table would give only 1,160 acres of success, and the abstract of expenditure for Changa Manga shows Rs. 78,889. But 520 acres have been transplanted, and 1,970 acres are ready for sowing. At the rate of 80 per cent. success, which, with a good water-supply, we are sure to attain, this would give an additional 2,000 acres for only a small additional outlay.

23. The working plan will prove all this information to be perfectly correct; but a rough calculation shows that our plantation has, up to the present time, not cost more than Rs. 30 per acre, including the great failures of the first years and the construction of a Rajbuha and outlet for at least 1,500 acres more.

24. The fact that the amount of new work exceeds so far our proposals requires a word of explanation. We had a great amount of wood cleared out of the rukh to prepare it for plantation purposes. This wood was mostly *Salvadora*, and we offered it in the market, but found no purchaser. At last Dina Nath of Lahore, offered to take the wood in payment of some work undertaken by him, and, as I thought the offer acceptable, I closed with him. As soon as the work is finished, the value thereof will be credited as income for sale of wood.

25. Another 300 acres I got worked in payment of a debt for cotton of last year. The purchaser, Gunga Ram, could not pay the amount, but had influence enough in the country to get people to work; so I preferred this mode of recovery to a law-suit.

26. Three hundred acres I got trenched by zemindars, with whom I made the following contract:—The zemindars trench the land they have taken up at ten feet distance with trenches 12 by 12 inches; we cut the water-feeders and connect them with our rajbuhas. The zemindars sow corn between, and we sow or plant trees on the ridges. They pay the water-rent, and we give them, in lieu of their work and expenses, three crops rent-free.

27. I hope that next year a much greater amount will be taken up by zemindars, as this is by far the cheapest way of raising a plantation, and, to the best of my belief, profitable to the zemindars. On the greater portion of the area we ridged ourselves; we dibbled in cotton between the trenches, which gave us a net income of a little more than Rs. 2 per acre, and kept at the same time the high grass down.

28. I mentioned about the Gundian Rajbahas and outlet. The rajbaha is four miles long, and has ½ a mile of high embankment. It was entirely constructed by us, and is able to water all the land between Gundian, the Vahn weir, and the Railway Station. The whole feeders are laid out systematically according to the levels of the country.

29. A system of roads has been laid out through the old and new plantations, with a view to facilitate the inspections and for future export of material.

30. *Success.*—Last year's great success I mainly attribute to two facts:—

Water-supply.—Firstly, the water-supply was good and well regulated,—thanks to the exertions of Mr. Phelan, the Canal Officer, and to his cordial co-operation with Mr. Minniken.

31, *Repairs.*—Secondly, through the introduction of a system of filling up blanks at once as soon as discovered, every Moonshee, Chaprassie and Beldar has been provided with a small hoe and bag full of seed. As soon as they discover a place where the seed germinates irregularly or not at all, they at once draw a small trench on the ridge and put seed in.

32. Besides these occasional repairs, I keep a gang of coolies (as intelligent as I can get them) steadily examining the new cultivations and filling in wherever it is wanted.

33. Whatever I have entered in my tables as success is so completely thriving that it does not want the slightest repair.

34. *Minor works.*—About 100,000 willow cuttings have been planted along the water-courses, and most of them do well.

35. A few acres have been sown with "Reru" *(Acacia Jacquemonta)*; many of these were touched by the frost, but the roots are alive.

On the lower places, where Sissoo suffers from want of drainage, I had cuttings of Tamarisk planted, which do well.

36. A few thousand of *Eucalyptus* have been raised in pots, but have not as yet been transplanted.

37. The chief difficulties we had to contend against in the plantation, and will have to meet in future and provide against, are frost, drought, floods, want of drainage, and rats.

38. *Frost.*—The frost has again killed all the Kikar in the place, with the exception of some few grown on embankments. I have made many experiments, but have not arrived at a satisfactory result.

39. *Effects of frost.*—In my report on trees grown in the plantations of the Punjab plains,* I have mentioned that the Kikar wants the greatest possible amount of circulation of air in and above ground.

I have seen Kikar killed by frost on the Ganges Canal between Boorkee and Hurdwar.

Reru has been killed down to the roots last year in several instances.

* These papers are with Mr. Brandis; I hope soon to have them for publication—B. P.

Siris (*A. Speciosa*), *A. Elata*, "Jaman" (*Zizygium*), "Ritha" (*Sapindus Sp.*), *Tectona grandis*, *Terminalia bellevica*, *Tamarindus Indica*, and "Neem," *Mehlia Azadirachta*, died of forest down to the ground. *Gmelina arborea*, *Inga duleis* and the "tallow tree" were only nipped.

Young Sissoo have been nipped severely, but sprouted again. *Ziziphus jujuba* two years old stood well.

40. *Droughts.*—We did not suffer much from droughts last year,—thanks to the regular water-supply.

41. Only some hundred *Eucalyptus* were killed by the hot winds.

42. *Floods with want of drainage.*—In the plot between the canal escape and the Vahn road the water stood for some time in low parts, and could not be got rid of. The two-year-old Sissoo on about half an acre died in consequence.

43. *Rats.*—Rats are a great nuisance in this plantation. They not only destroy the young plants by eating their roots, but prevent proper irrigation, filling feeders and trenches with earth.

44. The income for last year was—

	Rs.	A.	P.
For grass	2,058	0	0
For cotton	2,500	0	0
For grain, &c....	99	0	0
For wood	5,000	0	0
Total ... ... Rs.	9,657	0	0

against an expenditure of Rs. 78,889.

45. Briefly to recapitulate the work done last year, we have—

Four miles of Rajbaha with 1½ miles embankment and 10 miles of feeders, on 130 acres new trenching and intrenching, 610 acres successful sowing and 520 acres transplanting, a system of roads, the preliminaries of a working plan, and minor works.

46. I must give here Mr. Minniken the greatest credit for the careful way he has carried out my instructions, and above all for his indefatigable supervision of detail work during the hot season.

47. *Proposals.*—My proposals for next year are laid down in my budget, and, with the same abundant water-supply as we had last year, we are sure of success as far as cultivation is concerned. The water-supply is my only anxiety, especially as a new weir is being built near the Railway bridge, which might possibly prevent a good head of water being sent down.

48. *Khanwah.*—The second canal plantation is the Khanwah Plantation, in the Montgomery District. It lies in the same plantation circle, but the chief drawback here for the purpose of inspection, as well as for future export, is the distance from the Railway. It has been decided, with the approval of Government, to complete a small portion of land already prepared for sewing, and then to leave it alone. The total success in Khanwah is about 150 acres at about Rs. 60 per acre cost.

49. In 15 years' time we may expect a retnrn from this plantation. The capital expended will then amount to Rs. 105, calculating 5 per cent. simple interest.

Judging from the present growth, we cannot expect more than 500 maunds per acre in 15 years; and, in consequence of the distance from the Railway Station, Okarah, the wood will not sell at a higher rate than Rs. 5 per 100 maunds. We therefore will have an income of Rs. 25 against an expenditure of Rs. 105, or a loss of Rs. 80 per acre over an area of 150 acres.

50. Water-cost and supervision will be covered by selling grass and leasing part of the land for cultivation; and perhaps a small profit may be made out of this.

51. Last year's work consisted in the ridging of 90 acres, but it could not be sown, as no water-supply was obtainable. The 90 acres will be sown this year. I propose no other new work on this plantation.

52. *Sukh Ravi.*—The Sukh Ravi Plantation is not exactly a canal plantation, but, as its water-supply depends on overflow, we may include it in the same category.

53. Dr. Stewart in his Report of 1867-68 calls the land sailaba, but in my opinion the land is much too stiff ever to admit of percolation of water from the river.

54. Up to 1868 500 acres were cultivated, but, as the river changed its course, the place was left dry, and the success is *nil*.

55. Five hundred acres then were dammed in with a "bund," so as to let the water in at pleasure. The bund, with repairs, cost Rs. 3,000, and has proved a failure. I repaired it again last year with the greatest care, and sowed 50 acres with Sissoo and Kikar; but, as the broadest side of the bund, about a mile in extent, lies against the stream, it gave way once more, and all my sowings were destroyed. As soon as the water went off, the 50 acres were again re-sown with Kikar, which came up satisfactorily, but partly died away again. 200 acres of the place are fairly covered by a natural growth of Tamarisk. The dam keeps cattle and fire out.

56. *Rukh-improvement system to be tried.*—It is my intention to keep the plot and treat it on quite a different principle. I shall let the water in and saturate the place, and will then dibble in Jhand, Reru, Tamarisk and other indigenous plants, and let the whole grow up a mixed rukh. There is hardly a doubt that I shall succeed so far, but the place will not give the same regular out-turn as a well-stocked plantation would.

The yield I expect is 450 maunds in 15 years. It is hardly possible to speculate on the financial results of this plantation, and I would propose to write off as a loss under the heading of experiments the Rs. 11,364 expended on it up to the present moment, and begin a new account, treating the plot only on improved rukh principles in a cheap way.

57. *Tera.*—The fourth plantation irrigated by canals is Tera. According to Dr Stewart's Report, 1868-69, 600 acres had been operated upon. Dr. Stewart mentions the excellent success of Kikar, but they have all been destroyed again by frost, and the success with this tree may be put down as *nil.* Since then we have tried in vain to fill up the blanks in this plantation.

58. The difficulties with regard to watering are great, as only 300 acres out of the 660 are low enough to be flooded : the rest is watered by means of Persian wheels and bullocks.

59. Even in our last year's report we were hopeful of being able to cover the whole area by intertrenching. I had but little experience in working the Tera Rukh before the report was submitted, but during the working I satisfied myself that the ground was too hard to expect a good growth without a constant water-supply and a good drainage at the same time.

60. I dug up roots and compared them with roots of trees grown at Changa Manga They looked small and stunted, and had altogether an unhealthy appearance. The trees did not flourish on places where there was little water-supply, and died on spots where the drainage was not good.

61. I came very soon to the conclusion that the plantation would never pay, especially not that portion where the water had to be raised ; and I stopped the work after intertrenching 60 acres and planting them with Sissoo and Mulberry out of nurseries. The transplanted trees live and begin to sprout out again with the spring.

62. I at once proposed neither to extend the plantation nor to repair the old one without making better arrangements as to water-supply.

63. The greater part of the area on which we now have to raise the water might be flooded if a small weir were to be made in the rajbaha, but even then I am doubtful if we could create a paying plantation,—certainly not with the trees we have tried hitherto. Both *Acacia Arabica* and *A. Elata* perish of frost. Sissoo does not flourish in hard soil. Its growth and roots, as well as the fact of its dying down after attaining a considerable height, are sufficient proofs of this.

64. My idea is to sow on the portion I can flood all the blanks with Jund, Reru and Phulai, give them a few waterings, and leave the rest to nature.

65. The Inspector-General of Forests, during his recent visit to the Punjab, agreed with me that this plantation, up to the present, is an unprofitable investment.

66. Some Rs. 33,676 have already been expended, and we can show only a success over 250-300 acres. This would give a cost of about Rs. 100 per acre. I cannot recommend watering this plantation any longer, with the exception of such portions as may be sown with Phulai, Reru, and Jund. But even without water-rent at 5 per cent. simple interest for 15 years the outlay per acre will amount to Rs. 175, and, with cost of maintenance and supervision, to Rs. 190.

67. As far as financial results are concerned, I can make no calculations, as on account of the dying down of large trees it will be impossible to ascertain the probable amount of what will be left on the ground when we begin our rotation.

68. *Rodeshab.*—The remarks I made on Tera may very nearly be applied to Rodeshab.

69. The ground of the plantation is too high and too hard ; the water has to be raised by "jellars," the cost of watering an acre is eight annas each time; and, as constant watering is indispensable to the well-being of young plants, the amount spent per acre is between Rs. 5 and Rs. 6 per annum.

70. On the oldest and best portion of the plantation trees very soon began to exhibit symptoms of decay. The leaves of *D Sissoo* of 18 inches circumference lost their color, insects attacked the tree and it died. At first I was somewhat doubtful as to the cause, especially as I observed that in many instances trees apparently in full sap and growth perished in the manner described above. After a careful investigation I became convinced that the physical qualities of the soil cause the death of the plants.

71. I dug up a number of roots of decayed trees which exhibited symptoms like those already described, and found always the same indication. In the subsoil, nearly impenetrable to water, the roots formed were small, but healthy. The moisture had collected in the upper layer of soil, and, as water could not drain away nor evaporate fast enough in consequence of high grass, the roots began to rot, fungi collected round it, and the tree perished, leaving the lower roots healthy.

72. The only remedy we have is to water less; but the consequence will be an exceedingly slow growth, as we see now exhibited on parts watered by "jellars."

73. Last year we intertrenched 100 acres, of which we planted 20. The trees planted on the ridge are alive and green. The rest of the land intertrenched I propose to sow, as in Tera, with Reru, Phulai and Jhund, water them once or twice, and allow it to grow as a rukh without further irrigation. This will be the only part of the plantation watered this year.

74. The expenditure for Rodeshab is about the same as in Tera,—we have 160-170 acres success for Rs. 18,930.

75. The financial results are as uncertain as those of the last-named plantation.

76. *Serai Amanat Khan.*—Fortunately, only 300 acres of the plantation have been cultivated : the soil, though more favourable as regards levels, is the worst we have.

There are spots on which the Sissoo grows well, but these are exceptionally good parts or close to water-courses.

In our former memo. we say that the plants are difficult to raise, but, once raised, they grow well ; so they do up to a certain time ; but I have observed last year whole lines of them perishing. The roots being dug out, bore no comparison to the height of the plant, and could not penetrate the hard and stiff soil.

77. Kikar grows well on some spots, but only close to water-courses. I should recommend cultivation between the lines, the zemindars paying for the water besides a small rent.

78. We have only 150 acres success for Rs. 18,676 expenditure, and our expectations here are even worse than at Rodeshab and Tera, as the Railway station is further off.

79. As in Tera and Rodeshab, I would recommend to have Jhund, &c., sown on the untrenched parts, and water them ; but it is hardly worth while to keep this piece of land in the Plantation Division.

80. *Nâg.*—Nâg is the last of our canal-irrigated plantations, and, next to Changa Manga, the best. It has also the most promising prospects.

With the exception of 60 acres actually bad soil, the plantation is much better stocked than the three previously named.

81. All last year's cultivation succeeded admirably, and 35 acres covered with Toon are in the most flourishing condition ; some of the trees have grown in one season up to a height of nine feet ; the average height is above four feet.

82. There is no work to be done in the plantation next year.

83. Here the financial expectations, with the exception of Changa Manga, are much more favorable than those of the other canal plantations. We can count a success on about 250-300 acres, and our expenditure amounts to Rs. 19,838. This would give about Rs. 70 per acre, or in 15 years, at 5 per cent. simple interest—

$$\frac{70+70\times 15}{20} = \text{Rs. } 122\text{-}8.$$

Water-rent, supervision and maintenance, at least Rs. 2 per annum, will be covered by the sale of grass and thinnings.

84. The value of the forest in 15 years will be very near the cost.

85. I do not fear any loss in this plantation, and the wood sold as timber at Amritsar will even make it yield a profit.

SAILABA PLANTATIONS.

86. The second class of plantations which obtain their water-supply by means of percolation comprises four,—Jugian-*cum*-Shâderah, Loodiana, Noushera and Delhi.

87. *Plantations given up.*—Two others,—Sonaki and Molwahn,—have been given up for reasons explained in former reports. Another, Jagadri (at present untouched), is too small to be commenced as a separate work. If we can obtain a reasonable area in addition, it will be worth while to locate an officer there.

88. *Jugian.*—Four hundred and seventy-nine acres of land had been sown at Jugian up to 1870, blanks had been repaired, and about 430 acres were well covered (when I took charge of the plantation), at a cost of Rs. 5,219. This would give about Rs. 12 per acre ; 5 per cent. simple interest for 15 years added.

$$12 \times \frac{12\times 15}{20} = \text{Rs. } 21$$

Annually one rupee per acre for supervision	...	„ 15
Total	...	„ 36

89. The yield will be at last 750 maunds per acre by the end of fifteenth year. This is not too high, as may be seen by the annexed valuation survey of a piece of Sailaba, yielding 1,000 maunds of dry wood in 13 years. It consists of a valuation survey of the Sissoo plantation on Belah Soinlah, which is Sailaba land in the Jhelum river.

The Sissoo was sown 13 years ago, and has been thinned two years ago. The most favorable place was selected.

Girth. Inches	No. of trees.	*Area of girth.* Cubic feet.	*Total area of girth.* Cubic feet.	*Average height.* Feet.	Average form class.	*Contents.* Cubic feet.
14	1	0·108314	0·108314			
16	1	0·141471	0·141471			
17	1	0·159708	0·159708			
19	2	0·199496	0·398992			
20	5	0·221049	1·105245			
21	5	0·243706	1·218530			
22	11	0·267469	2·942159			
23	7	0·292337	2·046359			
24	20	0·318310	6·366200			
25	11	0·345388	3·799268			
26	15	0·373572	5·603580	43½	0·75	1,861·25
27	13	0·402861	5·237193			
28	12	0·433255	5·199060			
29	9	0·464755	4·182795			
30	10	0·497359	4·973790			
31	8	0·531069	4·248552			
32	8	0·565884	4·527072			
33	2	0·601805	1·203610			
34	2	0·638830	1·277660			
36	1	0·716200	0·716200			
37	1	0·756540	0·756540			
39	1	0·840540	0·540540			
	140		57·062638			

Remarks.

The area surveyed was 40,000 square feet; the contents per acre are therefore—

40,000 : 43,560 : : 1861·25 = 2026·9 cubic feet.

Tree No. 1—

26½" × 44′ = 17·075432 cubic feet contents.

Actual measurements.

	Mds.	Seers.			
Fuel	4	21	=	40·9	per cent.
Timber	3	20	=	31·82	,,
Small fuel	1	0	=	9·09	,,
Brushwood	2	0	=	18·18	,,
	11	1	=	99·99	,,

say 11 maunds, equalling @ 64 lbs. per cubic feet, 13·75 cubic feet actual contents;

$$f = \frac{\text{actual contents}}{\text{contents.}} = \frac{13{\cdot}75}{17{\cdot}07} = 0{\cdot}8$$

Tree No. 2—

27" + 43′ = 17·32 cubic feet contents.

Actual measurements.

	Mds.	Seers.			
Fuel	3	0	=	30·45	per cent.
Useful Timber	4	17	=	44·92	,,
Small fuel	0	20	=	5·07	,,
Brushwood	1	37	=	19·54	,,
	9	34	=	99·98	

equally, @ 64 lbs. per cubic feet, 12·31 actual cubic feet contents;

$$d = \frac{\text{actual contents}}{\text{contents}} = \frac{12{\cdot}31}{17{\cdot}32} = 0{\cdot}71$$

64 lbs. green = 1 cubic foot.
80 lbs. ,, = 1 maund.
Average form = class =
$\frac{0{\cdot}8 + 0{\cdot}71}{2} = 0{\cdot}755$, say $\underline{0{\cdot}75}$.

90. The gross annual revenue would be 50 maunds per annum per acre, or in such close proximity to Lahore, Rs. 7-8-0; add an annual income for grass at about 8 annas per acre; total Rs. 8.

Against this revenue stands an outlay for maintenance of supervision, not amounting to more than Re. 1 per annum.

91. Dr. Brandis, in his report of 1868, para. 38, enters against the gross revenue the interest of the capital expended,—but without counting for increase of trees.

92. This would be quite correct if the area to be cut in the 15th year had been planted in the 1st; if that to be used in the 16th had been made in the 2nd; and so on. But we have planted the whole area at one period, and the trees over the whole of it will reach maturity at the period our rotation begins. They will therefore represent at that time a capital equal to the want of the next rotation of 15 years.

It follows that the increase on wood and value during that time is a profit which must be written against the capital expended and its interest.

93. Our account for Jugian, taking the same figures as above, stands thus per acre :—

Jugian at the period it reaches maturity.

Cr.		Dr.	
For grass and products ...	Rs. 7 8 0	Cost of cultivation and interest ...	Rs. 21 0 0
		Supervision for 15 years ...	„ 15 0 0
		Total	„ 36 0 0
		Balance Rs. 28-8-0 to the bad at the beginning of the first rotation.	

The account at the end of the first rotation will stand as follows :—

Cr.		Dr.	
750 maunds of wood being in stock at beginning of the rotation ...	Rs. 105 0 0	Balance ...	Rs. 28 8 0
Increase during the rotation, see table below :— $\frac{7\text{-}15\text{-}50}{15}$ = 350 mds. =	„ 52 8 0	5 per cent. simple interest for 15 years,	„ 22 2 0
Minor products ...	„ 7 8 0	Supervision, @ Re. 1 per annum, for 15 years,	„ 15 0 0
Total ...	„ 165 0 0	Total ...	„ 65 10 0
		Balance profit Rs. 99-6-0, or net profit per annum during the first rotation of Rs. 7-8-6.	

Note.—The area of x acres is mature,—that is y years old; the rotation is y years.
The area x is of course divided into y blocks.
The annual growth $= z$ per annum.

End of 1st year $\left(\frac{1}{y}\right)$ x has been cut, leaving $\left(\frac{y-1}{y}\right)$ x to increase by z.

„ 2nd „ $\left(\frac{2}{y}\right)$ x has been cut, leaving $\left(\frac{y-2}{y}\right)$ x to increase by z.

„ $-y$ 1 year $\left(\frac{y-1}{y}\right)x$ has been cut, leaving $\left[\frac{y-(y-1)}{y}\right]$ x to increase by z.

The total of this decreasing arithmetical progression, and therefore of the whole increase of wood is $= \left(\frac{y-1}{y}\right)\left(\frac{y-1}{y} \times \frac{y-1}{y}\right) \times z\right) = \frac{y-c\,1}{y} x.\ z.$

94. The rate of increase in future rotations will depend mainly on the manner and cost of reproduction.

95. *Shaderah.*—A new part of Jugian is the Rukh Shaderah, about 500 acres in extent, in the immediate vicinity of the former. I regret to have to report that here a great and the cheapest success we could boast of has been destroyed by unforeseen and unavoidable causes.

96. To regulate the river for the building of the Northern State Railway bridge over the Ravi, spurs were thrown out in the river, which altered its course completely. Soil upwards of 100 feet in breadth, and with fine young plants on it, was daily carried away by the river.

I calculate the whole loss to amount to 100 or 150 acres. About 30 acres more were taken up by the Northern State Railway for building the temporary bridge and stocking material.

Of course such losses must make the rest more expensive. But even including these losses, the expenditure of Rs. 1,111 for 150 acres success is exceedingly small. Counting all that has actually been done, the cost of cultivation, including seed, is not more than Rs. 3 per acre. This includes the planting of 50,000 willow cuttings, 350 *Eucalyptus* (which are all alive), and 200 Mulberry and Sissoo transplants. Of these, only the Mulberries live, owing to the plants being put out too late in the season.

97. The financial results will even be more satisfactory than those of Jugian.

98. *Loodianah.*—The next sailaba plantation on our list is Loodianah. Two hundered acres were taken up under Act VI. of 1857.

99. In 1867-68 it was sown with Kikar and *Dalbergia Sissoo.* At the end of the year 70 per cent. were estimated successful. A year after, however, a large amount of them were drowned, leaving about 60 per cent. success.

100. In the course of last year I transplanted from nurseries young Sissoo, Neem and 1,50,000 willow cuttings, thus filling up the greater part of the blanks. During the rainy season I sowed Kikar between the lines, which were originally 15 feet apart. On places where the Sissoo was liable to be drowned. I trenched and planted the young seedling, on the ridge; and on the worst places the willow cuttings were stuck in.

101. The cost for the year was Rs. 1,016. About Rs. 500 more will be spent next year and the whole area will be so completely recovered that I can leave it under a protective, establishment alone.

By the time the plantation is completed, the cost will amount to Rs 4,800, or Rs. 24 per acre, or after 15 years $\frac{24 \cdot 15}{20}$ = Rs. 18-8-0 ; 0-8-0 for supervision per acre = Rs. 7-8-0.

	24-0-0
	18-0-0
	7-8-0
Total expenditure	49-8-0

Against this we shall have at least 750 maunds per acre, at Rs 10 per 100 maunds lowest estimate, equal to Rs. 75, besides a yearly grass rent of at least 0-8-0 per acre.

After 15 *years.*

		Rs.	A.	P.
Total value	...	82	8	0
Total expenditure	...	49	8	0
Profit (per acre)	...	33	0	0

102. Last year's work was throughout successful, and the plantation would have been finished had it not been that Mr. Davies,* the Forest Ranger in charge, misappropriated the funds entrusted to him for the completion of the work, which he stopped on his own authority, alleging that he was compelled to do so for want of funds.

* This officer has been dismissed.—*B. P.*

Just before he stopped the work I had inspected the plantation, and became only acquainted with the facts when it was too late to finish the whole work.

103. *Nowshera, on the Beas.*—Nowshera is another sailaba plot of 858 acres extent.

I must repeat here what Dr. Stewart said in his report of 1867-68,—*viz.*, that owing to the fact of the plantation being so far distant from constant supervision, the work has not been done so well as in other plantations. I spent Rs. 1,500 in replenishing, but the entire success cannot be estimated higher than 400 acres, the cost of which will amount to about Rs. 1,200, or Rs 30 per acre.

104. The plantation will hardly yield an out-turn equal to the expenditure. As I have no certain data to go upon as regards rate of growth and market, I will not give an opinion as to financial results.

105. *Delhi Plot.*—The last sailaba plot we have up to the present under cultivation lies below the city walls of Delhi.

On the 1st of April 1870 510 acres were made over to the Plantation Division. Work was commenced as soon as possible after the transfer, but, on account of the shortness of the working season, caused by heavy fall of rain, not more than half of the land was completed. This was sown with Kikar, Sissoo and Toot; the quantity of Kikar was almost equal to that of the two last-mentioned together. The whole germinated in due course, but almost two-thirds were afterwards drowned by floods, which covered the whole plot for several days.

106. After the termination of the rains some few acres were re-sown, and the seed sprang up.

About 2,000 Toon were planted during October, all of which do well.

Five thousand Mulberries planted are all alive.

Along the banks of the Nullahs and rivers 3,000 willow cuttings have been planted, and do well.

Our whole success at the present is about 100 acres, at an expenditure of Rs. 1,974 or about Rs. 20 per acre.

107. This is considerably above the estimate, but the flood which destroyed the greater part of our cultivation, was quite an exceptional occurrence: the land had not been under water for a period of seven years. If possible, we shall finish 300 acres more during the rains of next year, for less than half the cost of our first cultivation.

108. But, even with the expenditure of Rs. 20 per acre, the plantation, owing to its close vicinity to Delhi, will be one of the most paying. Fifteen rupees per 100 maunds is rather a low estimate, and with a yield of only 700 maunds per acre in 15 years, this will be equal to Rs. 105. After next year's work I shall be in a better position to make a reliable estimate. The work last year was exceedingly well executed under the steady supervision of Mr. Wild, and fully deserved the success the first aspect before the floods led us to expect.

109. *New Sailaba.*—On the new Sailaba lands separate reports have been forwarded for the orders of Government.

The cultivation on this description of land is by far the cheapest, and nearly always yields a good return. I recommend sailaba land being taken over whenever a chance presents itself.

110. *Plantations watered by wells or rain-fall.*—Plantations watered by wells, and kept alive by natural atmosphere, moisture, are Tillouri, Jullunder and Phillour.

111. In Tillouri, on 477 acres of land Rs. 7,142 have been expended, showing only an exceedingly small success. In 1867-68 the whole rukh was trenched and sown with Kikar, but no success at all was obtained.

112. The Kikar came up, but perished. In 1868-69 it was re-sown, and came up, but again died down. The land is not sailaba, but subject to occasional floodings. The soil is a somewhat hard and stiff river clay, with sandy sub-soil. In the beginning of 1870-71 there was hardly any reproduction, and only little work was done last year. It was our intention to plant about 250 acres with Sissoo, and accordingly a nursery was made in March and April last; but, on account of the insufficiency of the water-supply, very few seeds germinated, and at the time when the work might have been carried out hardly any seedlings were available. Several thousand two-year Sissoo and Toon were planted on a plot near the river bank. The cultivation was made late in the year, but, nevertheless, most of the seedlings had taken roots. In addition, about 3,000 willow slips were planted on the banks of the nullah, and are, with scarcely an exception, alive and healthy. Around the spots where old Kikar trees had been removed, I sowed Kikar seed; and this experiment proved successful.

The reason of this is that in removing the tree the top-soil is penetrated. A good mixture of this hard top-soil and the lighter sub-soil forms a soil favorable to vegetation. The water, in case of flooding, drains off, being no longer retained by the stiff upper layer, in conjunction with which it used to form an adhesive moist clay.

113. It is difficult, if not impossible, to form an opinion on the financial results of a plantation, when only the last year's experiments have been successful, especially if those experiments have been on such a small scale.

114. *Phillour.*—In the Phillour Plantation Rs. 11,212 have been expended on an area of 235 acres, or between Rs. 47 and Rs. 48 an acre. This enormous expenditure is due to a mistaken experiment of trying to sow and water the whole area by wells. Our last year's cultivation, which extended over three-fourths of the whole area, at a cost of only Rs. 1,486, proved this expensive method to be quite unnecessary. We reared the young plants, Sissoo and Mulberry, in nurseries, and transplanted them during the rainy season, and gave them a few waterings just to start them and help them on a little. Hardly a plant is dead, and the whole may fairly be considered a success. The small portion of the plantation left uncultivated will be finished by the end of the season, and only a protective establishment kept on.

115. Again the financial results of this plantation will not admit of a fair criticism, as at least two-thirds of the expenditure was more or less unnecessary. But, even burdened with all this useless expenditure, we must count it amongst our paying plantations. After 15 years $47 + 47 \times \frac{15}{20}$=Rs. 82-4, the cost will be more than covered by the out-turn of only 600 maunds, at Rs. 15 per 100 maunds, equal to Rs. 90.

The protective establishment will be paid by the sale of grass and thinnings.

116. *Jullunder.*—Jullunder is only a bit of 40 acres, and has cost up to the present time Rs. 2,871. As to the cultivation, the remarks made on Phillour Plantation may be applied to this spot. It might have been at a smaller outlay, but will just cover its expenses.

Last year it was proposed to make a plantation at Bouli Lehna Singh. We established a nursery; but as the rukh was refused to us, we had to give it up again, and stopped the work.

117. The above report shows that large sums have been expended on plantations which can never return an adequate profit.

The sums expended on Khanwah, Sukh Ravi, Tera Rodesha, Serai Amanat Khan, as well as on the three plantations, Sonaki, Moolwahn and Jugadree, abandoned last year, can only be expected to be partly recovered. I do not mean to assert that all the plantations, taken as a unit, would not yield a return equal to the sums expended even with the great losses our first experiments have entailed on us; but this fact does not afford a fair inside view of the case, more especially as regards the practicability of arboriculture in the Punjab plains.

118. I would propose to return the non-paying plantations to the Rukh Division, or treat them, more or less, on improved rukh principles, and to write off the expenditure thereon as profit and loss.

119. The plantation I recommend to keep on and enlarge as much as possible is Changa Manga, which is capable of being extended to 20,000 acres, and can be brought to yield, 15 years hence, a yearly out-turn of at least 8,00,000 maunds (value Rs. 80,000—Rs. 1,00,000), or more than the whole demand of the Mooltan-Amritsur line.

120. The *Ravi, Chenab, and Jhelum Sailaba.*—5,000 acres Government land fit for plantation, are available on these rivers, and I recommend to plant them.

121. Nâg, Jullunder, Phillour, Loodianah, and Dehli Plantations I would suggest to keep under any circumstances, as they amount altogether to 1,650 acres only, and are close to thriving places, which will consume the whole out-turn leaving no supply for the Railway.

Tillouri, too, will hardly yield more than can easily be consumed in Dehli.

The above statement shows the Mooltan line more than provided for by our plantations alone, the Northern State Railway supplied with about two lacs of wood per annum from our plantations, and the Dehli line without any provision at all from the plantations of the Punjab.

How to provide for the Dehli, and partly for the Northern State Railway line, has become a vital question. The resources of our Plantation Division alone are totally inadequate to supply the demand, if more energetic measures be not speedily taken.

122. A hundred acres at one place, and 200 acres at another, taken wherever land was to be obtained, with only native supervision and occasional European visits, does not answer the purpose. As soon as this was understood,—but not before labor and money had been wasted,—this mode of proceeding was condemned.

123. First of all we must have a safe basis to work upon. Do we know the amount of supplies we are deficient in up to the present time? Different people offer different opinions, but it has never been worked out systematically and according to facts,—what amount of fuel can actually be obtained on the Dehli and on the Northern State Railway line, for what prices, and without planting.

124. There are forests in the North-West Provinces which might yield considerable supplies, such as the Dhoon and other forests at the foot of the hills. There are also the Kalesar forests in the Punjab, the lower forests on our different rivers, the rukhs in Lahore, Goojrat, Goojeranwalla, Shahpoor and Jhelum Districts, and again Changa Manga.

The rukhs in the Mooltan and Montgomery Districts are so considerable, that I believe they will be capable of supplying the greater amount of fuel required on the Mooltan line; and Changa Manga could, after a lapse of 15 years, easily throw four or 5,00,000 maunds on the Delhi line,—the line of export being the Bari Doab Canal.

125. The above is only a brief list of the forests we have to fall back upon.

126. The most important point we have to consider is the market. We have to supply a Company's Railway from Mooltan to Delhi, and a State Railway from Lahore to Jhelum. There are therefore two entirely distinct markets which we propose to supply.

127. It should be ascertained, as accurately as possible, by careful surveys, valuation surveys, and calculations, what amount each of the forests near enough for these markets can yield continuously,—that is, a working plan should be made of each of them (forests, rukhs, and plantations), taking particular care as to lines and means of export. When once these facts have all been established, the producing places should be so distributed over the market as is easiest and cheapest with regard to the transport, irrespective of districts or even provinces.

128. This accomplished, we are in a position to point out the places where a steady supply is wanting, and where, therefore, we must fall back upon artificial production of fuel.

The necessity of this fact once proved, it becomes a question of political economy. Land to the extent wanted, and of an approved quality, should be taken up under any conditions whatsoever. But first let us be quite certain *where* and how much land we require for our purpose, or we may possibly be guilty of the same mistakes and fall into the same errors as before.

129. At Khanwah and Montgomery,—places with considerable natural fuel supplies,—we spent Rs. 20,000, for which I can assign no other reason than that land was available there.

The only land I would invariably take up is sailaba, on account of the cheapness of cultivation.

The work here proposed would take several years to complete, but, if a speedy and energetic beginning be made, success is certain to attend us.

Abstract of Expenditure on each Plantation, up to end of March 1871.

Name of Plantation.	Area of each Plantation.	Up to 1st of April 1870.			Up to 31st March 1871.			Total.			Remarks.
	Acres.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
Nâg	500	16,531	2	7	3,307	5	10	19,838	8	5	
Serai Amanat Khan	300	16,836	14	5	1,839	13	8	18,676	12	1	
Noushera	858	10,395	2	0	1,602	3	4	11,997	5	4	
Sonaki	200	1,301	11	9	...	...		1,301	11	9	
Jullunder	46	2,037	2	6	834	7	11	2,871	10	5	
Phillour	235	9,726	0	11	1,486	1	8	11,212	2	7	
Loodiana	200	3,463	5	0	1,016	10	4	4,479	15	4	
Jugadree	200	6,568	10	7	138	11	0	6,707	5	7	
Tillouri	477	6,334	1	7	808	6	3	7,142	7	10	
Tera	660	26,036	14	4	7,639	8	3	33,676	6	7	
Rodeshah	270	14,077	3	9	4,852	13	1	18,930	0	10	
Jugian	479	5,219	14	4	1,111	1	2	6,330	15	6	
Changa Manga	3,650	41,704	13	0	52,066	14	1	93,771	11	1	Outstanding on 1st April 1870 ... ... Rs. 18,290 5 0 Ditto ditto 1871 ... ... „ 3,408 2 0 Balance ... ... „ 14,882 3 0
Khanwah	360	7,759	3	0	1,817	10	3	9,576	13	3	Outstanding on 1st April 1870 ... ... Rs. 711 0 0
Ravi	600	10,411	1	9	1,732	8	3	12,143	10	0	Ditto ditto ... ... „ 778 12 3
Bouli Lehna Singh	100	83	8	6	2,121	1	7	2,204	10	1	
Delhi	800	...			1,974	0	0	1,974	0	0	
Surrungwal	40	1,209	3	1	12	11	0	1,221	14	1	
Moolwahn	40	118	8	0	...			118	8	0	

No. 189, dated Kassaoli, 1st June 1871

From—J W. MACNABB, Esq., Offg. Commissioner and Superintendent, Ambâlah Division

To—The Offg. Secretary to Government, Punjâb

IN reply to your No. 296, dated 3rd ultimo, I have the honor to report regarding the Sutlej waif as follows.

2. In my No. 530, dated 30th December, to the Secretary to Government, Department Public Works, I expressed my views on the general subject.

3. The Chiefs principally affected by the question are not only Beláspore, but Súkeit, Bují, Kumârsein and Sangrí.

4. Beláspore, commanding the river on both banks for 50 miles and lying below the others, is the most interested. It is also the next wealthy of the States on this side the river, and is always most ready to fight for its rights. Bují, Kumársein and Sangrî have also protested, but in a milder manner.

5. I have to-day had a meeting of Major Batchelor, Deputy Conservator of Forests, and the Vakîls of Beláspore, Bují, Kumârsein and Sangrí.

6. The States claim the right of waif in all "unmarked timber," grounding their claim on a rúbkarî of Mr. John Lawrence, Commissioner, Trans-Sutlej States, dated 5th December 1846, in which the Hill Chiefs were warned to *mark* either with the *initial letter* of their State or with a *device*, all wood they might cut, and that whatever was not *so marked* would be considered "waif." This order was intended to apply to Government rights to waif in British territory; it of course also applied to waif in Foreign States.

7. This definition has been acted upon in various decisions of the Húshiárpúr Courts in claims by or against the Belâspore waif contractors.

8. In Department Public Works Circular 1C., dated 6th July 1864, it is said "all *unmarked* timbers or wood found on the banks of any river within British territory, are the property of Government as *waifs*."

9. From enquiries I have made and from my previous knowledge of the subject, I have no hesitation in stating my conviction that hitherto the custom of the river has been to consider as "waif" all "unmarked" timber, and that this "mark" was a device, the duty of engraving or burning such device being imposed on those cutting timber to prevent disputes.

10. It is evident that where there have been several contractors as well as Government cutting in the forests for many years, it would be impossible for any of these parties to establish a proprietory right to any log which had not a mark (device) upon it; such log was therefore ownerless, and, as such, "waif."

11. This is the claim of the Chiefs, and I hold it to be proved as regards time past.

12. The Forest Department, however, states that no one cuts wood on the river now but themselves; therefore they claim all cut wood in the shape of logs as their own.

13. If the facts are so, the claim must at once be admitted.

14. I have tried to find out, if it is impossible that any logs cut by other than Government should find their way into the river.

15. There are two classes of forests. The most important are in Bussâhir and Kûlû; these Government has taken into its own hands. The Bussâhir arrangements are, a payment to the Raja of Rs. 3-8 per standing tree, and an yearly payment of Rs 1,500 for all unclaimed wood. This includes river "waif," but the great bulk of it is wind-fall timber or unclaimed felled logs which the department cut into logs and send down their slides into the river.

16. The Belâspore Vakîl states that the Kûl-Bail stream is large enough to carry down logs, also the stream opposite Gûro. The Deputy Conservator replies that no one has ever cut into the forests on these streams except Wuzîr Gosain, and Sirsin, a contractor, whose timber was at once confiscated by the British Government. He further states, as a fact within his own knowledge, that there is no timber in Bussâhir which can possibly come into the Sutlej by floods except that cut by Government, all timber cut by former contractors in accessible places having long since been carried away. Major Batchelor has resided in Bussahir for many years, and is perfectly competent to make this assertion; while, on the other hand, the Belâspore argument limits itself to an

assertion that were the Government work stopped for a year, large quantities of cut but unmarked timber would still come down; secondly, that Government could easily arrange to mark its timber. The Deputy Conservator replies that he has 10,000 logs at present lying in Bussahir unmarked, as it is too expensive to mark them till they are brought pretty near the river, and that it constantly occurs that large logs fetch way on the slides and rush past the marking place into the river.

17. On the above grounds I consider it proved that all cut timber from Bussahir and Kûlû must be held to belong to Government, *i. e.*, not "waif." It is admitted that no timber comes from above Bussahir.

18. The second class of forests are those lower down the river, which are not in charge of the Forest Department. On the right bank they lie on the Bisnî and Rotla streams. In the former the forests are in Mundi, Sukeit and Kûlû, at the very head of the various tributaries; and it is evident from the statements of the Sangrî and Kumârsein Vakîls that only small timber can come down, and that all cutting has been stopped for the last year. The forest on the Kotla is being cut by the Raja of Sukeit, and it is admitted that all his timber comes down in squared beams,—in fact "sleepers," not logs.

19. On this, the left bank of the river, there are the Narkunda in Kotegurh and Kuneitî, but the timber is only *cheer*, and not claimed by the Forest Department; second, the Padowa, in which the deodar forests are in Kumarsein and Bujî; third, the Raoti in the above two States, and in Keonthul, Kote and Mudhan. In all these it appears, that by some verbal order of Captain Grey this time of the year cutting logs by *beaparees* was stopped, and the only cuttings now going on are by the Chiefs and zemindars for their own purposes, also by certain contractors, and Keonthal, Kote and Mudhan, who cut the timber into planks and carry it into Simla by the road. It is clear that some of these parties would cut their trees into such logs as are intended for the river, and which are the subject of dispute. It is, moreover, evident from the admissions of other Vakîls that nothing but small logs, a foot in diameter and 10 feet long, could float in the upper part of these rivers where the forests are.

20. Reviewing the whole matter, I am not prepared to go so far as Major Batchelor and say, that in all that tract of country it is *impossible* that *individual* logs might not be cut by zemindars in positions from which they may find their way into the Sutlej; yet from the fact that all easily removable timber has already been cut, that zemindars have to get permission before cutting big trees, and that they cut them in the form required for their houses and not into logs, it is highly improbable that any but an infinite small number should find their way into the Sutlej; I therefore think that with such a very strong presumption in favor of the department, with regard to any particular logs, they have a right to claim all cut logs.

21. It will be observed that one of the facts necessary to this conclusion is, that the cutting by *beaparees* should be prevented in the States below Bussahir; this has been done apparently on a veral order of Captain Grey, when officiating before Major Parsons' arrival, but it is not objected to, the fact being that the forests are so far from the river, that it would only be by a greater outlay than private individuals meet, that they could be profitably worked.

22. If the Forests Department are not prepared to lease these forests at present, I believe no opposition would be made to an order forbidding the cutting of trees into logs, but allowing them to be cut into scantlings of various sizes; but without some such order by Government authority, it will be impossible to assert that the Government is the only log-cutter on the Sutlej, but at present I have no doubt that such is practically the case.

23. If the above view be adopted, "waif" on the Sutlej will consist of all unfelled timber, which will be known by its having roots or branches, or being broken and jagged at both ends, any "device" or "number" being also absent.

24. The Officiating Conservator holds that such timber will only become waif when stranded; but I am convinced that the States have always exercised the right, and I maintain that they are entitled to it of catching waif in transit down the stream. The Deputy Conservator, Major Batchelor, admits that they have always exercised it, and does not object to their doing so still.

25. If Government adopt the above definition of "waif," it is evident that the Chiefs will suffer a considerable loss of revenue. Belâspore has lately sold his waif contract at about Rs. 3,000 per annum, but it must be remembered that these contracts only date from 1856-60, it having apparently not been worth while to let them out previously, but little wood being cut.

26. If Government decides in the above sense, it will be necessary to make the new definition of waif apply to the timber at present at Belâspore, as, if I am right in my facts and deductions, it will hold good of last year's timber as well as this, for, from the enquiries I have made, I don't think any of the *beaparees'* timber cut the previous year was left, and certainly not in positions where it could be brought down by the streams to any appreciable amount.

27. As, however, the abrogation of the old definition of "waif" was not notified to the Chiefs, and as by *orders* passed in consequence of No. 3,362, dated 13th June 1870, Secretary, Department Public Works, they collected this timber, the whole of which, with the exception of one log worth Rs. 200, and a few smaller ones, is axe or saw cut, I think they are entitled to their expenses at double the rates usually paid by the department.

28. As the river is rising, and wood may at any moment come down the Sutlej, I have directed the Chiefs not to consider felled timber as waif, pending the order of Government.

No. 582, dated Lahore, 8th September 1871

From—LEPEL GRIFFIN, Esq., Offg. Secretary to Government, Punjáb

To—The Offg., Conservator of Forests, Punjáb

I AM directed to reply to your letter No. 447, dated 11th August 1871, and former correspondence with the Secretary to the Government, in the Public Works Department, on the subject of timber asserted to be the property of Government, and wrongfully seized by the Raja of Belâspore as waif, the right to which was claimed by him.

2. The Hon'ble the Lieutenant-Governor having carefully considered the representations of the Forest Department and the report of the Deputy Commissioner of Simla (No. 103, dated 31st January 1871), who had visited Belâspore, inspected and counted the timber, directed the Commissioner of the Ambálah Division to furnish a report showing clearly and fully the claims to waif timber asserted by the Raja, and the rights which he has to waif. It was directed that a clear definition should be given of what the Raja understood by waif, for, on this point the decision of the question much depended. The report of the Commissioner (No. 189—1443, dated 1st June, and a copy of which is forwarded for your information), contains a clear summing up of the points in dispute, and the conclusions at which the Commissioner arrives appear to the Lieutenant-Governor to be generally equitable.

3. Subsequent to the receipt of the report, the Raja of Beâlspore submitted a petition against the decision of the Commissioner, but nothing is urged which has not been considered and answered in Mr. Macnabb's letter.

4. The Raja considers himself entitled to all unclaimed timber having no no mark, and which may be thrown on his shores, or which may be captured as it floats past his territory. This right he asserts to be possessed by all Hill States, and to have been enjoyed by him ever since the British rule. The right was continued, the Raja states, by Mr. John Lawrence, Commissioner, Trans-Satlej States, in an order of the 5th December 1846, in which the Hill Chiefs were enjoined to mark, either with the initial letter of their State, or with a device, all wood they might cut, and all wood not so marked would be considered waif. All the Hill Rajas, it is asserted by Belâspore, have acted in the spirit of this order, and have not considered timbers axe or saw-cut, and with no other device, as marked in accordance with the order, and have taken possession of such timber as their undoubted right.

5. It is evident to the Hon'ble the Lieutenant-Governor that the time has come when the nature of waif must be defined with more precision than has hitherto been the case, and in conformity with equity and good sense. Supposing the timber at present claimed by the Forest Department at Belâspore to be the undoubted property of Government, the Raja could hardly imagine that the

Government rights would be abandoned in obedience to a forced interpretation of an order of 1846, which may have been equitable as far as the States *inter se* were concerned, but which practice has shown to have been most injurious to the rights and interests of the British Government.

6. The Lieutenant-Governor accepts the finding of the Commissioner as to the facts of the case that, although it is possible occasional logs of wood, the property of private persons or the Hill States, may, under exceptional circumstances, find their way into the Satlej, yet that, practically, the Government alone fells timber by axe or saw on the Satlej, or on those streams flowing into the Satlej, of sufficient depth and volume to carry a log into the main river, and that consequently all logs cut by axe or saw are presumably the property of the British Government.

7. The definition of 'waif' on the Punjáb rivers is in future to be that to which every one waives his claim, or to which no owner can show any right or title by reason of the impossibility of identification. No other definition would be accepted by a Court of Law. A mark, a letter or a device is ordinarily necessary, and always advisable ; but it would be absurd to argue, if an owner was able to prove to the perfect satisfaction of a Civil Court that certain unmarked timber was his property, that such timber should be declared liable to confiscation as 'waif.' The right of 'waif' commences where the power of identification ends. In ordinary cases no identification is possible without a letter or device upon the timber ; but where, as in the present case on the Satlej, the Government alone cut logs, the mark of the axe or saw is as satisfactory a proof of ownership as any device could be.

8. The only waif on the Satlej to which the rights of the Hill States can be admitted are logs, trees with roots and branches uncut, the result of windfall or snow-fall. To such their right is absolute : to logs cut by axe or saw, the right of the British Government is absolute, whether the logs are marked with a letter or device or not. In order to avoid the possibility of any logs, not the property of the Government, getting into the Satlej, the Commissioner and the Agent, Lieutenant-Governor, Cis-Satlej States, will be requested to make, if practicable, friendly arrangements with the Chiefs concerned, to prohibit, in the States below Bussâhir, the cutting of trees into logs, but permitting their being cut into scantlings of various sizes. No objection to such an arrangement will, it is believed, be made, and all doubt as to waif on the Satlej, under the definition now accepted by the Government, will be at an end.

9. With regard to the claim of the Chiefs to 'slave' timber or to seize waif as it floats past their territories, the Lieutenant-Governor yields the point. The right cannot be maintained from a legal point of view. The water-way of the great rivers undoubtedby belongs to the Government, and the Chiefs have no valid claim to other waif than that thrown on their shores ; but the custom of salvage has been allowed for a great number of years, and the loss to Government from its continuance will be trifling.

10. The Raja of Belâspore requests in his petition to Government that, should his rights to felled timber as waif be disallowed, a cash allowance may be made to him, and that the timber ; seized as waif last year by the State, and now taken possession of by the Forest Department, may be restored to him.

11. The Hon'ble the Lieutenant-Governor considers the action of the Forest Department to have been right in asserting the title of Government to the seized timber, and both Major Batchelor and yourself are deserving of the commendation of the Government for your prompt action in saving it from loss.

12. The Lieutenant-Governor declines altogether to consider the question of compensation for waif rights, now cancelled, These rights were little better than piracy. The Government annually cut a certain number of logs on the Upper Satlej, and each Chief, as these logs ran the gauntlet past his State, sent out swimmers to capture them, and all those on which the Government device had been obliterated by accident; or which had escaped, as is often the case, unmarked into the river, were detained and sold for the benefit of the State, although the timber could have belonged to no one but the Government. The Lieutenant-Governor does not blame the Chiefs following a pratice which the Government had not interfered to stop, but he considers all claims on the part of the States for compensation for the loss of income, which was in reality taken from the Government treasury, preposterous.

roceedings of the Hon'ble the Lieutenant-Governor, Punjáb, in the Land Revenue Department,—No. 813, dated 14th November 1871.

READ—

Report on Forest Administration for 1870-71, by Baden Powell, Esq., Officiating Conservator of Forests, Punjáb.

THE Hon'ble the Lieutenant-Governor has read with pleasure the clear and interesting report of Mr. Baden Powell, the Officiating Conservator, who has given a complete account of the working of his department throughout the past year.

2. The financial results of the year are somewhat difficult to estimate, as so large a portion of the assets of the department consists of timber stock in the depôts or still lying felled in the forests. The difference between assets and liabilities at the commencement and close of the year most fairly represents the financial results; and this shows an increase, after certain deductions have been made, of about a lakh of rupees, which is the profit really credited to Government.

3. The forest system in the Punjab has as yet hardly got into efficient working, though very much has been done within the last two years to perfect it, and the Lieutenant-Governor believes that a fair and increasing profit may yearly be expected.

4. The principle of the rules which has been accepted by the Government for leased and reserved forests is to close them as much as possible against forest rights of grazing, burning, &c., allowing the people inhabiting the neighbouring villages to exercise these rights in portions of forest land set apart for their use. It is most difficult to introduce efficient conservancy while private individuals are allowed rights which are absolutely antagonistic to proper conservancy; at the same time it is very important to make the people content, and not to take away any of the privileges they have enjoyed from time immemorial without giving to them a complete equivalent. The difficulty of satisfying both requirements has very successfully been overcome in Húshiárpúr by Mr. G. Duff, the Assistant Conservator, who, working in harmony with the Settlement Officer, has induced the people cordially to agree to rules which, though favorable to the land-holders, are not so favorable as to abandon any of the just claims of the Government. The lease of the Chamba Forests, and the rules for their conservation, have been prepared in a similar spirit, and will probably work well.

5. The long-disputed question of waif, at least on the Satlej, has been set at rest by a ruling (copy of which and of its annexure are appended) which will effectually protect the Government from what was a recognized system of plunder by the Native States bordering the river, past which Government logs launched from the forests had to run the gauntlet, the department losing all which were caught or stranded, on which a Government mark had been obliterated, although the logs were of such a size, and sawn in such a manner, that no one but the British Govetnment could possibly be the owner. The principle asserted on the Satlej will, with some modifications, apply to other rivers in the Punjáb. Want of precision in definition, and a too careless regard for Government interests, have cost the treasury yearly large sums of money. The evil became intolerable, when extended operations were undertaken in the higher or more valuable forests, and it is hoped that the rules and definitions now laid down will adequately protect Government interests, while they have amply respected the ascertained rights of Hill States, denying such as in reality were mere misappropriations of Government revenue.

6. His Honor the Lieutenant-Governor trusts that the demarcation and reservation of the Hazára Forests, now in progress under Mr. Reynolds, may be carried out with great care. The rights of the people here seem to be of a more definite character than elsewhere, and the Lieutenant-Governor, when lately in the Hazára Hills, noticed a certain anxiety on the part of the people as to the action of Government, which it will require tact and liberal treatment to remove.

7. The more valuable portions of the Punjáb Rakhs have now been made over to the Forest Department in the Cis-Indus districts, and the arrangements made for cultivation, grazing and reservation are working fairly. The miscellaneous income from these lands may be expected to show a steady increase.

8. Plantation is perhaps the most important of the duties of the Forest Department, and has been too long neglected in the province. The efforts hitherto made to ensure a sufficient stock of new trees have been desultory and unsystematic ; and, the increasing demand for wood, occasioned by the increase of the population and the construction of Railways, has been greatly in excess of any new supply from planting either by the Department or by District Officers. The great increase of cultivation has, besides, had the effect of clearing large tracts formerly covered with jungle ; and, although there may not be sufficient data available to assert that an injurious effect on the rain-fall has been the result of the destruction of trees, yet this result may be anticipated, unless systematic and energetic efforts are made to plant largely and maintain the supply equal or in excess of the demand.

9. His Honor believes that while much may be done by District Officers encouraging the landholders to plant along their water-courses or about the village site, the main work of plantation must be carried out by the Forest Department, which has a sufficient establishment to supervise and control the operations. Thus alone can the great and increasing demand of the Railways be met, and it is necessary to have plantations of such extent, in near proximity to the lines of Railway, as to meet their entire demand without the necessity of purchasing in the open market, and thus encouraging the people to cut down timber which it is most desirable to preserve.

10. The results of the plantation work of the year seem to prove that to be financially successful it is necessary that the plantations should be of considerable size. The small scattered plots of a few hundred acres each, are not worth the labor and expense bestowed upon them, and their existence is only justified by the extreme difficulty of obtaining lands. But the Lieutenant-Governor is of opinion that the difficulty is one which must be overcome, and that delay will only increase it, while the necessity of eventual action will not be removed.

11. The supply of fuel is an urgent and important question, and whatever extent of land is necessary for plantation purposes must be taken sooner or later. The price in some cases will be high, but the value of land is rising year by year in the province, and delay will only make the necessary expenditure greater and not less. The plantation on the Multán Railway at Changa Manga is at present the only one of real importance, and although at present hardly a fifth of its area is under plantation, yet it can be extended to 20,000 acres. This plantation has been, in spite of some disappointments at first, fairly successful, and increased experience will probably make the losses by death of trees and requirements of re-planting annually less. There are no sufficiently large plantations in the neighbourhood of the Northern State Railway or the Punjáb and Dehli Railway. The latter line is the best provided, and in the Amritsar and Jalandhar Districts are small plots, which would be valuable were they of larger extent. On both these lines of Railway large plantations might advantageously be formed, and the Lieutenant-Governor will be prepared to consider favorably any carefully-matured proposals for taking up land sufficient to ensure their financial success. The out-turn of the Changa Manga plantation when fully taken up, may be expected to yield an out-turn of 8,00,000 maunds, worth nearly a lakh of rupees, and equal to the supply required for the Railway from Amritsar to Multán. On a large scale the plantations will be successful in attaining the real object of a certain and sufficient supply of fuel ; and will also pay a fair profit on the outlay ; while small and scattered plantations will do neither ; and His Honor is strongly of opinion that the Forest Department should concentrate its strength on the former instead of frittering it away on the latter.

12. The description of land on which the cultivation pays best appears to be that known as sailába, the low land on the borders of rivers, the percolation from which is sufficient to nourish the trees without artificial irrigation. His Honor agrees with the Conservator of Forests that these tracts should be taken up and planted wherever practicable, and the objection to small areas does not apply to these as to other plantations, if only they are not in places so remote as to render supervision impossible.

13. With the remarks of the Officiating Conservator regarding the magisterial powers of Forest Officers the Lieutenant-Governor does not entirely agree. In remote tracts it is probably necessary to invest them with such powers, but

in the Fuel Reserve and Plantation Divisions there seems no such urgency. There is the obvious objection of permitting the officer directly interested in the case to adjudicate upon it, and the Lieutenant-Governor imagines that the people would prefer the inconvenience of having to attend a Magistrate's Court several miles distant, to the alternative of being tried and punished by an official who had a direct interest in their conviction. His Honor is generally unwilling to invest with judicial powers any officers belonging to purely executive departments, unless the necessity is clearly proved.

14. The Hon'ble the Lieutenant-Governor is pleased to concur in the praise given to the officers of the department who have done good service during the year. The Officiating Conservator, Mr. Baden Powell, is deserving of the special acknowledgments of Government, for the ability and industry with which he has conducted the duties of his department during the past year, and for the success with which he has inaugurated what may be called a new system of Forest Administration.

ORDERED.—That the report be printed with the foregoing resolution, and forwarded to the Government of India in the Department of Agriculture, Revenue and Commerce, for the information of His Excellency the Governor-General in Council.

Also that the report be distributed in the usual manner.

By order of the Hon'ble the Lieutenant-Governor,

LEPEL H. GRIFFIN,

Offg. Secretary to Government, Punjbá.

APPEDNIX P.

PROGRESS REPORT

OF

FOREST ADMINISTRATION

OF THE

PROVINCE OF OUDH

1870-71.

SECTION 1.

INSPECTION OF FORESTS.

Officiating Conservator's tours of inspection commenced on 21st November 1870, finished on 15th June 1871.

1. The Officiating Conservator of Forests left Lucknow on the 21st November, and inspected the Kheree and Baraich Divisions twice during the working season; first, in December, January, and February; and second, in May and June. He also examined the Forests in the Gondah Division, during February and March, and completed these tours of inspection on the 15th of June.

Sal coppice woods, in the Kheree District, resumable by Government.

2. The extensive woodlands in the Kheree District, consisting chiefly of sal coppice, which are liable to resumption by Government, were examined in the early part of the season, and application made to the Commissioner of Seetapoor for their transfer to the Forest Department. These coppice woods only require proper treatment and strict conservancy to make them very productive, both of timber and fuel. The delay in resuming these grants and transferring their management to the Forest Department appears to be the necessity for a minute survey, to ascertain the area of cultivated land, and to mark off an equal area of waste to which the grantees are entitled by one of the conditions of their grants.

Four grants transferred to the Forest Department, in 1870-71.

3. The five grants specially referred to in last year's report have been made over to the Department, one in 1869-70, and four in 1870-71, and the Commissioner of Seetapoor hopes to be able to give the Department possession of some of the others shortly.

Proposed method of working these woodland grants.

4. It is proposed to work these grants as mixed coppice woods, by cutting a certain area of copse, in a fixed rotation of years, for the supply of fuel, rafters for native houses, &c., chiefly to supply local demand, and reserving 50 trees of the best growth and most useful species per acre for the supply of timber, as well as to shed seed to replace old stumps. A commencement has been made on this plan by cutting the sal copse on 30 acres of one of the grants in the Kheree District, to supply the Public Works Department with sal bullees, and on 100 acres in the Ramghur grant, area about 2,000 acres, near Fyzabad, to supply small wood and charcoal for the Fyzabad fuel market.

Jungle fires.

5. Fires were kept out of the Ramghur grant and out of considerable areas of forest in each Division, but this was due rather to the early setting in of the rains than to the success of the precautions which were taken by this Department. Strenuous efforts were, however, made to keep fires out of certain portions,

but under existing rules these portions could not be absolutely closed, and the consequence was that the blocks were set fire to probably either by shikarees or cowherds.

Arguments in favour of fires.

6. The Commissioner of Seetapoor, and probably many others, are of opinion that jungle fires instead of being injurious are highly beneficial to forests, and that to burn down the grass and brushwood is to supply the soil with one of the best and most chemically complete manures known to science, not to impoverish it. That so far from the ashes being washed away by the first showers, the most valuable part of them is soluble in water, and the first rain-fall which wets the ground carries in with it such of the valuable parts of the manure as have not already been transferred to the soil by the heavy dew. That the finest forests, we know, in Oudh and Nepal, have been systematically burnt every year for centuries past, and yet the ground is covered with as much fine timber as it can nourish, and therefore fire evidently favours the growth of tree vegetation. That the jungle fires thin out the dense masses of sal seedlings by a kind of natural selection, destroying the weakest, but merely cutting back the strong shoots until they are strong enough to top the fire, which merely prunes off their lateral branches when they want the assistance most. That, in addition to this, the fire destroys millions of insects which prey upon trees, if allowed to live, and do much more harm than the fire.

Arguments against fires.

7. The opposite view of the effects of jungle fires, held, I believe, by all Forest Officers in all parts of the world is as follows :—

Fires do irreparable injury to forests :—

1*st.* By destroying or at least greatly deteriorating the humus or vegetable surface soil provided by nature, which absorbs and retains the needful supply of moisture, dissolves and holds in solution till wanted the required constituents of forest soil, and furnishes the best seed bed and nursery for the young plants. Fire burns up all the vegetable components of this surface soil, and leaves only the mineral elements contained in the ashes of plants, which are of no use without the presence of carbonic acid and other solvents, the chief source for the supply of which is the decomposition of dead vegetable matter.

2*nd.* By either killing or greatly injuring nearly every tree which comes within its reach, as proved by the blackened remains of all young plants, and the gaping wounds and old scars seen on the bark of the older trees.

3*rd.* By exposing the trees to the attacks of insects, which as a rule prey only on trees which have been maimed either by the axe or fire.

That fire thins out the dense masses of seedlings is a fact, but at the same time it inflicts grievous injury on the trees which it does not succeed in destroying. That the finest forests in Oudh and Nepal have been ravaged by fire every year for centuries is probably a fact, but only proves that nature, under favourable circumstances, triumphs over her fiery antagonist, and by dint of superior vital energy and the combination of her forces, produces fine forests in spite of these jungle fires. Compact forests, such as those in Nepal, remote from cultivation, and hitherto little worked, suffer from the fire much less than those which like most of the Oudh forests had been continually cut before they came into our hands. Before the British occupation, the axe had already made terrible inroads on the Oudh forests and greatly impoverished them. In such forests, fire commits great havoc, it cuts off the straggling trees and thins out the other parts which are already too thin. It promotes the growth of rank grass, and this grass again increases the violence of the flames. In more compact forests, like some parts of the Kheree Division, which are being cut by the Forest Department under a regular working plan, it is of vital importance, for the reproduction of the forest, that the blocks in

which the felling operations have taken place should be absolutely closed against every one during the hot dry season, with the view of keeping fire out. There can be no improvement in the quality of the sal timber of the Oudh forests, which has at present such a bad name, unless the conditions of growth are improved. At present, the great majority of the sal trees in the Khyrée-gurh forests are either crooked, hollow, or knotty, but in the few parts which have escaped fires for two or three seasons, the young saplings are coming up in masses straight and vigorous, and have a beautifully smooth bark. In the parts ravaged by fire, on the other hand, the few saplings which have survived the fiery ordeal have all lost that healthy appearance, and deformity or premature decay will be the inevitable result in their case, as it has been in the case of the parent trees, unless fire is kept out.

Fires can only be prevented by absolute closure during the dry hot weather.

8. Government has gone to considerable expense in cutting division and sub-division lines through the forest, with the view of facilitating communication and of preventing fires; but this last object will be entirely frustrated as long as this Department is not empowered to restrict traffic to the lines thus cut, and to close the compartments, in process of reproduction, absolutely against every outsider during the dry hot season.

Evils of unrestricted cattle grazing.

9. But fire is not the worst enemy which forest conservancy in Oudh has had to contend with. Unrestricted cattle grazing, aided by the ever ready axe of the herdsman, has done far more injury than even fire. The constant tread of the vast herds of cattle has interfered most seriously with the germination of sal seed in many parts of the Oudh forests. In those parts of the Baraich and Gondah forests where the ground is rather low and the forest greatly overrun by cattle, natural reproduction of sal has almost ceased, and, if the present state of things continues, the extinction of these sal forests, as soon as the present stock is cut down or decays, is a certainty. The only remedy for this evil is to close one-third of each forest section against cattle grazing for at least ten years. This restriction would hardly be felt by the people, and it would benefit them in the long run.

Damage done by cattle browsing.

10. In the Baraich and Gondah forests, great damage has been done by the lopping of branches for the browsing of cattle. Efforts have been made by this Department to put a stop to it, but with little success. The cowherds find it easy to elude the forest watchers, and, when they are caught, the fines imposed by the Magistrates are sometimes so small that the herdsmen continue the practice, only with greater caution. Some parts of the Gondah forests have been reduced to scrub by this practice. In other tracts every large tree except sal has been deprived of its lateral branches. The only way to stop this is to prohibit the herdsmen from carrying axes in the forest, but this cannot be done under existing rules, and the only other alternative is to inflict adequate punishments on the offenders.

Injury done to the forests under the Three Mile Rule.

11. Clause VII. of the Oudh Forest Rules, known as the Three Mile Rule, is another fruitful source of injury to the forests. Under the shield of this rule, Rájáhs and Ta'alukdárs, Mahájans, and petty traders residing within three miles of the forest, cut and remove any quantity of unreserved green wood, professedly for their own use, but probably in many cases for sale.

12. Under this rule, the Rájáh of Bhinga has taken out of the seventh section of the Baraich Forests, several thousand cart loads of wood fuel during 1870-71, for burning bricks for building purposes, and the bazár in Bhinga is built chiefly of wood thus obtained free by the mahájans of the place. This rule was, I believe, framed solely for the benefit of cultivators on the border of the forests, who were supposed to be too poor to be able to pay for wood which they required. If so, the rule requires modification.

SECTION II.

RESERVES.

The question of private forest rights or privileges.

13. No commission has yet been appointed to enquire into the claims of villagers to the exercise of forest rights or privileges in the Oudh forests, and, if valid, to ascertain and record their nature and extent, and how they can be regulated or commuted with least injury to the forests. An investigation of this kind is greatly needed as a preliminary to the introduction of strict forest conservancy. The Oudh forests have all been demarcated, but a satisfactory settlement of the question of forest rights and privileges is still required to make them strictly reserved forests.

Increased area of the Oudh Forests.

14. They may, however, all be included under the name of forest reserves or State forests. Their total area has been increased by the addition of the four wooded grants referred to in the first section, which cover a total area of 15,230 acres, or about 23·8 square miles. The whole area of State forests in Oudh, including the 6,150 acres, or 9·6 square miles added last year, is therefore about 735 square miles.

Transfer of forest land in satisfaction of the Maharajah of Bulrampoor's claims.

15. But while we have extended our borders in one direction and hope to extend them still further, we are about to give up 47,628 pakká beegahs, or 24·7 square miles of forest land, in the Gondah division and eighth section of the Baraich forests, in satisfaction of the claims of the Maharajah of Bulrampoor, to a large portion of the Gondah forests, chiefly based on the old settlement rules, which entitled him to waste land equal in area to the cultivated and fallow lands of 118 villages bordering on these Government forests; also to compensation for 36 deserted villages, and to the fifth forest section, Baraich, which was granted to him, and afterwards resumed by Government. Four villages in the interior of the fourth section of the Gondah Division are also to be given up by the Maharajah, with a view to the consolidation of this section of the Gondah forests, which is the only one in that division which contains good sal.

Mutual concessions in connection with the above transfer.

16. The Maharajah and his tenantry, on the other hand, in consideration of receiving forest instead of waste land are to give up the exercise of all forest rights or privileges, whether grazing, cutting of fuel, or the felling of timber, in the Government reserved forests after this special assignment has been made, and these grants are to be maintained as forest and grass lands for the benefit of the adjacent villages. The tracts proposed to be assigned consist principally of grass land and inferior forest land, although a considerable area of good miscellaneous forest, and, in some places, a good deal of sal have necessarily been included, in order to provide a sufficient area of wood land and pasturage for each group of villages within three miles of the Government forest boundary.

Formal agreement required to complete the above arrangement.

17. These village forests have already been marked off under the joint supervision of the Settlement Officer, Captain Erskine, and myself, and, after a personal examination of each portion assigned. They have also been surveyed and mapped by Major Anderson, but their specific apportionment, as fuel and pasturage allotments to each group of villages, still remains to be done. A formal agreement with the Maharajah of Bulrampoor, together with rules for the management of these village forests, have also still to be drawn up. A map showing the distribution of these fuel and pasturage allotments is attached to the Report, Appendix I.

The Kooano Sal wood lands in the possession of the Maharajah of Bulrampoor.

18. The Kooano Sal forests, referred to by Captain Wood in last year's report, have not been included in the concessions proposed to be made to the Maharajah in the Toolseepoor forests, as it is not yet certain whether the 7,903 acres of the Kooano sal coppice woods, said by the Settlement Officer,

Captain Nicholson, to be claimable as the property of the State, is really so or not. The Maharajah is said to claim that area as a grant, and if he succeeds in substantiating that claim, the Kooano wood lands can only be resumed on the ground that the Maharajah has failed to fulfil the conditions of his grant. This will be taken up as a separate case.

Sal wood land grants in the Gondah district.

19. The question whether the grantees of sal wood land in the Gondah district have all fulfilled the conditions of their grants, has already been referred to the Deputy Commissioner for report. Those wood lands consist principally of sal coppice, in various stages of growth, and are for the most part situated on the Kooano and Chumnai streams—the former a tributary of the Raptee and the latter a feeder of the Gogra. Those in possession of the Maharajah, which are claimed by this Department, were examined by me in March last. They have been repeatedly cut down in an irregular manner and otherwise very badly treated, but some of them have lately been strictly conserved by the Maharajah, and look very promising. A list of the grants bordering on the Kooano and Chumnai streams is attached, Appendix II.

Forest boundaries.

20. All the forest boundaries in Oudh may be considered as finally settled except those of the seventh section, Baraich division. The Rajah of Bhinga has decided to sue the Court of Wards, with a view to recover possession of all the land said to belong to the Bhinga estate, included in that section, through alleged neglect of the said Court.

State of the boundaries.

21. The forest boundaries and boundary marks in the Gondah division were inspected by Mr. Forrest, and reported to be in a satisfactory state and unencroached upon. One or two encroachments on the Kheree and Baraich forests were brought to notice and put a stop to.

Boundary ditch in the Baraich division.

22. Seven miles and two furlongs of ditch and bank have been made round part of the fifth section and 23 miles 6 furlongs of this kind of boundary have also been formed along part of the eighth section of the Baraich forests, which contains the most valuable sal tracts in that division. The cost of this work has been Rs. 35 per mile. Both these sections combined have a boundary 60 miles in length, which will be demarcated entirely in this manner, and a quick-set hedge of thorny bushes will be grown along the top of the embankment to serve as a barrier to trespass and encroachment, and thus facilitate forest conservancy.

Division of the Baraich seventh section into six forest blocks.

23. The seventh section of the Baraich forests has now been divided into six approximately equal areas by means of six ray lines radiating from the most central part of the section. A chokie, for the Forest Ranger of the 2nd sub-division is being built at this centre point, of materials found on the spot, and a good well has already been constructed there.

Proposed plan of operation in that Section

24. I would propose that one-fifth of the first class sal trees in one of these compartments should in future be cut down and removed for sale every year. The present stock of mature timber, which is rapidly deteriorating from premature decay, will be partially replaced by the 2nd and 3rd class trees, which, as will be seen by referring to Appendix III., are together more numerous than the 1st class. To secure the production of sal seedlings, it will be necessary to close each compartment in succession for 10 years against cattle. No sal seedlings are at present to be found anywhere throughout this section, except a few in a small enclosure made with the view of testing the effects of enclosing and scattering sal seed. The success of this experiment was only partial. Hundreds of seedlings germinated, but only a few have survived the heavy rain.

Line cutting and road making done during 1870-71.

25. In the Baraich Division, about 23 miles of the ray lines above referred to were cut during the year under review, and seven miles of road previously cut were freed from stumps and made practicable for traffic.

Important line of export cut in the Khyreeghur sal forests.

26. In the Kheree Division, a very important line of export, 50 feet wide and seven miles long, has been cut from the centre of the 2nd sub-division of the Kheree forests, south-east to Khyreeghur, at Rs. 40 per mile. When this road is completed and the other lines have been made thoroughly drivable, the traction engine, which Captain Wood is bringing out, will be able to ply from end to end of the Kheree forests, a distance of about thirty miles.

Road-making in the Kheree Division.

27. Nineteen miles of road, previously cut in the Kheree forest, were cleared of stumps and rendered drivable at about Rs. 110 per mile, and seventeen miles of road were repaired and portions levelled at about Rs. 52 per mile.

Forest buildings.

28. Two very useful forest chokies have been built, one at Moteepoor, in the Baraich Division, and the other at Bhugwanpoor, in the Gondah District; another was begun in the Kheree Division, also, but the contractor failed, and the work came to a standstill.

Wells.

29. Two wells were constructed at convenient spots in the Kheree forests, also one in the Baraich Division, in the centre of the seventh section, previously alluded to, and one in the Gondah Division in the middle of the forest chokie compound.

Requirements of the surrounding population, how supplied.

30. The surrounding population supply themselves with wood for domestic and farming purposes, either free, under the provisions of the Three Miles Rule, or on payment of royalty, either direct to this Department, under the kham tahsíl arrangements in force in the Baraich Division, or to the lessees of the right to levy royalty on minor forest produce in the Kheree and Gondah Divisions.

Rates of royalty on minor forest produce.

31. A list of the rates of royalty levied by this Department is attached, Appendix IV., but lessees are not restricted to any particular prices.

Advantages of the kham tahsíl system.

32. The great advantages of the kham tahsíl over the contract system are :—

1st. It is really less burdensome to the people, although more complaints are heard. They are not afraid of complaining against forest officials, but they fear the contractors, who are generally men of local authority and influence.

2nd. It enables this Department to regulate the outturn, particularly of dead timber, by the local demand, which does not vary much, and thus to equalize the yearly revenue from this source.

3rd. It necessitates the keeping up of a forest revenue establishment, which at the same time forms an efficient protective force.

4th. The kham tahsíl system is, if properly managed, much more uniformly profitable to Government in a financial point of view than the contract system, as proved in the Gurhwal and Kumaon forests in the North Western Provinces.

33. The disadvantages of the contract system are :—

Disadvantages of the contract system

1st. Contractors frequently evade the Three Mile Rule and levy duty from those who are legally exempt. They are at liberty to demand higher rates than those levied by Government. They frequently cut green trees and, after carefully barking them, bring them out as dead wood and otherwise do much injury to the forests with impunity, as it is very difficult to convict them.

2nd. Contractors remove, or induce others to bring out, as much dry sal as they can within the period of their lease. Thus, the local market becomes glutted, the dry wood leases become unsaleable, and a loss of revenue ensues, as has happened during the year under review.

3rd. As the timber brought out by these contractors is sometimes nearly as good as that brought out by this Department, and much greater in quantity as well as cheaper in price, the contractors are sometimes able to compete successfully with us in the principal timber markets, and thus deprive this Department of its main source of revenue.

34. On other hand, the contract system gives a forest officer less trouble than the kham tahsil system, which demands close attention to details to ensure its success.

Comparison of the two systems

35. As the Chief Commissioner has sanctioned the continuance, for another year, of the present arrangements made for collecting minor forest revenue by departmental agency in the Baraich Division, an opportunity will be afforded of comparing the results with those obtained in the Kheree and Gondah Divisions under the contract system.

36. Under existing rules, any one can graze his cattle in the forests on payment of three annas for each bullock, and nine annas for each buffalo. The leasing of grazing and miscellaneous produce is less open to objection than dry wood contracts are, although the advantages of keeping a departmental check on cattle grazing and on people cutting and removing miscellaneous forest produce, are very great, and the revenue establishment appointed to collect duty on dry wood can easily at the same time collect grazing dues and duty on miscellaneous produce.

The Oudh forests at present open to all for grazing on payment of grazing dues.

37. A return of forest cases, tried in the three divisions during 1870-71, is attached, Appendix V.

Protection of the forests.

A much larger number of cases might have been sent up, but the witnesses, being officials of the Forest Department, they could not be spared from their work at the time.

Inconvenience of having forest cases tried at a distance from the forests.

38. The investment of all divisional forest officers with petty magisterial powers, seems to me to be the only way to protect the forests effectively.

Remedy for this inconvenience.

39. The salutary effect of an early investigation of each case on the spot, followed by summary punishment, if convicted, and the great saving of valuable time, are the advantages which would accrue if the divisional officers were authorized to try cases under the Forest Act.

40. The probability is that magisterial powers in such cases would very seldom have to be used, and that the mere presence of magisterial forest officers would prevent the commission of any serious cases of breach of forest rules.

41. Unfortunately, none of the officers in charge of forest offices in Oudh have as yet qualified themselves for the exercise of magisterial powers.

Management and improvement of the Oudh forests.

42. The revenue survey of the Oudh forests was completed by Major Anderson during the year under review. It will therefore be possible to append a complete survey map of the Oudh forests on a reduced scale to next year's report.

Valuation surveys.

43. Valuation surveys, to ascertain the stock of timber in the forest, were made both in the Kheree and Baraich Divisions. The results of these surveys are given in Appendix III. Their combined results still shows that there are about three sal trees of first-class size on each acre of mature sal forest in those parts of the Kheree and Baraich Divisions where regular felling operations have not been carried on.

Plan of working the seventh section, Baraich Division.

44. The division of the seventh section of the Baraich forests into six approximately equal blocks, has already been reported, and the proposed plan of felling one-fifth of the first-class trees in one block annually under a rotation of thirty years was alluded to. It was also stated that the closing of the block operated upon for ten years was an essential part of this plan, in order to ensure natural reproduction. It may here be added that it may be necessary, in the lower levels of this section, to cut drains into the Rapti river, to prevent the lodgment of water, which is at present so fatal to the young plants, and to scatter sal seed in other places, where seed bearing trees are deficient in number.

Annual yield of the seventh section.

45. The annual yield of this section will be equal to the number of acres in the block, multiplied by three—the number of first-class trees per acre—and divided by five. This produce will find a ready sale either at Baraich or in the Goruckpore market, which at present is insufficiently supplied with sal wood.

Proposed concentration of the felling operations.

46. At present, owing to the irregular constitution of these forests, which contain trees of very various ages in one place, it is found necessary to cut the prescribed number of trees, here and there, over considerable areas, but efforts will be made to concentrate the felling operations as much as possible with the view of eventually grouping trees of one age together in one place, so as to have in each forest section, or working circle, representatives of all ages, from saplings up to mature trees, grouped together on separate and approximately equal areas.

Future operations in connection with forest working plans.

Survey of forest plots.

47. Enlarged maps of each forest section, or working circle, on the scale of eight inches to a mile, can now be prepared from Major Anderson's Survey Maps. These will be filled in by a minute examination and survey of each forest plot, differing in any important respect from the other parts of the forest, conducted by Forest Officers with prismatic compass, plane table and level.

Descriptive statement of forest plots.

48. The results of this careful analysis of the forest will be embodied in a descriptive statement, containing vertical columns for noting the distinctive characteristics of each forest plot under the heads of area, soil, situation and aspect, general character, species of trees, age, condition of the vegetation; proposed operations.

Combination of forest plots.

49. Plots of similar age and condition, or which can be approximately assimilated, in course of time will be grouped together, so as to form compartments, and these compartments will be marked off on the ground by lines sub-dividing the forest blocks, which have already been or will be formed in each forest section.

Demarcation of forest compartments.

50. The distinctive characteristics of the forest plots being intended to be obliterated and lost in the future homogeneous character of each compartment, it will only be necessary to mark off the plots with posts, but the compartments will have to be demarcated by means of lanes cut through the blocks.

Preparation of a working plan for each Forest section.

51. A working plan for each forest section, with a map of the whole, to accompany the general part of the report; and a separate map, on a larger scale, for each block, to illustrate the detailed plan of operations, will then be prepared.

Record of prescriptive forest rights.

52. An authentic record of the prescriptive rights and forest privileges with which each forest section is burdened, and the mode in which they have been regulated or commuted, either by mutual agreement or by the decision of a commission, will form a very important accompaniment to the report on the proposed working plan for each section.

Clearance of snags in the Sohelí river.

53. The expectation of the results of the first clearance of the Sohelí river from snags was not realized, and the work of clearing had to be repeated last dry season. The trees growing on the banks were also cut within a distance of ten feet from the river side to prevent them from becoming snags.

Obstacles to floating timber down the Sohelí river.

54. There are other obstacles, however, besides snags, to rafting timber down the Sohelí in the rainy season, and it cannot be used in the dry season at all for want of water.

Sudden freshes.

55. In the rains, the water in this stream comes down in sudden rushes, which either swamp the canoes encumbered with heavy logs, or drive them helplessly on the bank, at the first bend in the river, and sink them there. More than one thousand logs were thus either sunk or stranded in the Sohelí during last rains, as the result of the first experiment in floating on that river. About 1,000 of these have been recovered at considerable expense, and about 100 are irretrievably lost.

Difficulty of conducting timber floating operations on the Sohelí during the rains.

56. Orders have been issued to postpone the starting of the rafts, this year, till all danger of a sudden high flood is over, but the control of such operations in the rainy season, when the forests are deadly, labour very expensive, and all payments have to be made by native forest subordinates, is most difficult. The Sardah route, which is available in the dry season, should not in my opinion be abandoned in favour of the Sohelí route, but both should be used as found most convenient.

Project for rendering the Sohelí navigable in the dry season.

57. To render the Sohelí river navigable in the dry season, Mr. Dodsworth suggests that a series of dams should be constructed at intervals in its course, and he submits a plan, specification, and estimate, furnished by his brother, in the Public Works Department, which is attached in original, Appendix VI. A series of these dams would be too expensive, but I should say that one would suffice to raise temporarily the level of the stream below by successively storing up, and letting off a full supply of water. If the project is considered to be practicable, and certain to ensure the object in view, it would be well worth the money.

Jouraha Canal.

58. The cutting of a canal from the Jouraha nullah to the Sohelí was found to be impracticable, owing to the former being somewhat lower in level than the latter.

59. Two temporary bridges were built, as usual, across the Sohelí river, at the two main depôts of Suthiana and Doodooaghát, to facilitate the export of timber and forest produce. These bridges cost about Rs. 300 each per annum in putting up, taking down, repairing, &c. It would be far better, therefore, to erect permanent timber bridges across the Sohelí. The best places would be Doodooaghát and Khyreeghur. Suthiana is at present an important depôt, but the approaches to it are very swampy, and it is almost certain eventually to be abandoned. A plan of a bridge, designed by Captain Hills, R. E., who examined the sites of the temporary bridges, is annexed, Appendix VII. It would only cost about Rs. 1,500, and would last 15 years. A wooden lattice work bridge might perhaps answer better at Khyreeghur, where the river is of considerable width.

Bridges over the Sohelí river.

60. The bridge of boats was removed from Maroachaghát, as the Sardah river had changed its course, and put up last year at Puchpereeghát, which is on the straight road from Singhai and Khyreeghur to Lukhimpoor. There it was very useful to the public and remunerative to the department, although, owing to delay in coming to an agreement with the Deputy Commissioner as to the best place, the bridge was not established in time to reap the full benefits of the change. It is likely, however, to be permanently useful there in facilitating traffic with Nepal, as well as profitable in expediting the export of produce from the Khyreeghur forests.

Bridge of boats on the Sardah.

61. A departmental ferry was at the same time maintained at Sireenuggur, the nearest and best point for crossing the Sardah from Doodooaghát.

Departmental ferry on the Sardah river.

62. Eighteen canoes were made out of hollow sal trees at Rs. 25 each, and an offer of Rs. 60 for each boat has already been made. They would fetch from 80 to 100 each at Byramghat, but I think it will be more advantageous to maintain a fleet of departmental canoes on the Sohelí, as it is both difficult and expensive to hire canoes when wanted for rafting purposes, whereas boatmen can easily be got. This will render the department more independent of rafting contractors, who have nearly always hitherto failed and occasioned heavy loss and serious inconvenience to Government. This year, the floating operations are being conducted by departmental agency, under the supervision of an energetic forest ranger, Kasim Khan.

Boats for rafting timber.

63. The creepers in part of the third block of the second section of the Kheree forests had, by some oversight, been left uncut in the clearing operations of previous years. This was completed last year at a cost of Rupees 194-10-6.

Creeper cutting.

SECTION III.

Plantations.

64. One hundred maunds of babúl seed and about 90 maunds of sissú and khair seed mixed, were collected and have been sown broad-cast in about 86 acres of cleared ground hoed up in the Ramghur Grant, 12 miles north-east of Fyzabad, at about Rs. 12 per acre.

Ramghur plantation.

65. The babúl and sissú seed has germinated freely, and is coming up in a mass which will soon require to be thinned out, and the thinnings transplanted into other vacant ground.

Successful germination of the babúl and sissú seed.

66. Two or three maunds of bamboo seed, obtained from the Conservator of the North-Western Provinces, were also sown in some parts along with the other kinds, but at present bamboo shoots appear only in a few places in small tufts.

Bamboo seed.

67. Khair is also visible here and there only.

Khair seed.

68. These operations were energetically superintended by Mr. Down, Sub-Assistant Conservator of Forests, in charge of the Gondah Division, who has resided on the grant, since the commencement of rains, in the former grantee's bungalow, which was rendered habitable at a cost of about Rs. 450.

Superintended by a Resident Forest Officer

69. This plantation at the end of 15 years will contain about 100 trees standing on each acre, the produce of which will be at least 750 maunds of wood. The gross annual yield will, therefore, be 50 maunds per acre, which, in such close proximity to Fyzabad, should realize Rs. 7-8. The expenses during that time are not likely to exceed Rs. 36 per acre, which is the cost of similar plantations in the Punjab, including interest and maintenance for 15 years. The annual cost of supervision chargeable against annual rental will not probably exceed Re. 1 per acre

70. In the Kheree Division, four hundred bamboo seedlings were planted during April and May 1870, in a part of the sissú forests near the Sohelí river, and about 1,000 more were put into ground during the rains, but most of these transplants withered and died, from some cause not yet ascertained.

Bamboo plantations in the Kheree Division.

71. Another nursery was formed last dry season of bamboo seedlings, about 10,000 in number, transplanted with great care under Mr. Dodsworths' supervision, and kept watered in the hot season by means of a Persian wheel, but according to last reports, they also are beginning to wither and die, owing probably either to heavy rain, uncongenial soil, or too low a level.

Ill success of these plantations.

72. Some of the khair and sissú seed sown broad-cast, near the Newul Khar Fort, in May 1869, has survived the annual jungle fires, and thrown out fresh shoots.

Khair and sissú broad cast sowings.

73. The reproduction of sissú forests would be a very simple matter, if fires could be kept out, but these forests are so thin and the grass so thick that fires cannot be prevented unless they are entirely closed during the hot season, and insulated by clearing a broad belt round and setting fire to the outside grass early in the season. At present there is hardly a single young sissú tree to be seen, and the old ones are all twisted and knotted by repeated burnings.

Reproduction of sissú forests.

SECTION IV.

Yield and Working of the Forest.

74. The felling was confined to block 3 of the second section of the Kheree Division, block 4 having been exhausted of first class sal trees in the previous year's felling.

Felling.

75. 3,116 trees were selected and marked for felling by the head forest ranger.

Selection and marking of trees for felling.

76. Owing to failure, however, on the part of the felling contractor, only 1,445 of these were cut, logged and barked, within the official year. To these must be added 374 logs felled during April and May 1870. Of the total number marked, I believe more than 500 remained to be felled at the close of the working season, but this balance will be added to next year's fellings.

Felling not done to the full extent required by the working plan.

77. Sufficient care was not taken by the forest ranger in selecting these trees to reject all hollow and crooked trees, but I admit that it is sometimes difficult to ascertain whether a tree is hollow before felling it, and crooked trees frequently give two tolerably straight, though short logs, if cut across at the bend.

Insufficient care in selection.

78. Attention to the important fact regarding crooked trees, mentioned in last para., has been paid by Mr. Dodsworth in directing the logging operations. As he remarks "there is no advantage in having a long log if it is at all crooked, as the whole length of it cannot be brought into use." The trees have, therefore, as far as possible, been cut on this principle into the longest straight lengths available.

Trees cut into the longest straight lengths available.

79. Three thousand two hundred and eighty-eight logs, and 235 pieces of sleeper lengths were carted out of the forests up to 31st March, and 2,500 logs were carted out in April and May 1870, so that the total number received at depôts from the forests during the past year is 5,788 logs and 235 sleeper pieces or 6,023 pieces in all, as shown in the annual timber account.

Outturn during the year 1870-71.

80. Out of the above mentioned outturn, 184 sal logs were examined by me, to enable me to submit the report called for in the orders of the Government of India in the Chief Engineer's report regarding the quality of the Oudh forest timber.

Personal examination of the logs brought out.

81. The logs were examined in the order in which they lay at the depôt in lines, without selection, but in several different places. The following was the result :—

Result.

	Logs.
Sound and tolerably smooth and straight, ...	39
Sound, but more or less crooked or knotty, ...	67
More or less hollow, ...	78
Total, ...	184

82. This would seem to indicate that about one-fourth of the whole outturn are good logs, one-third are sound, but more or less blemished, and somewhat less than a half are more or less unsound.

Inference.

83. In order to prevent the bringing out of unsound timber in future, it will be necessary that all trees, intended to be felled by the Department, should be selected and marked under the personal supervision of a European forest officer, who will be responsible for the result.

More European supervision required.

84. In the meantime, only the good logs are being sent down to Byramghát and the inferior timber will be sold at the Sohelí depôts.

Inferior timber will be sold at the spot.

85. In April and May 1870, 3,046 logs were made over to the thirteen timber floating contractors for conveyance to Byramghát by the Sohelí route, during the rains of 1870. Of these, only 1,252 reached Shitabaghát, and were afterwards despatched to Byramghát. More than 1,000 were sunk or stranded in the river Sohelí, but have nearly all been recovered, and 600 fortunately never started.

Ill success of the timber floating operations on the Sohelí in the rains of 1870.

86. The causes of this disaster have already been explained. The canoes were either swamped by the sudden freshes, or wrecked on the snags and sand banks, or driven on the steep banks and sunk. There is hardly any harbour of refuge in the Sohelí river, where boats can find shelter from the first rush of water. The contractors and boatmen shamefully abandoned the rafts to their fate as soon as they became unmanageable, and returned to their homes.

Cause of failure.

87. This failure has caused heavy expenditure in the extraction of sunk logs, many of which were deeply embedded in silt, and some entirely buried, and it has also occasioned a serious loss of money paid to the contractors, who have failed, and whose only security and wordly possession are their canoes.

Consequences of this failure

88. The recovered logs will be brought down to Shitabaghát along with the past year's outturn of timber.

Recovered logs.

89. Twelve acres of land is about to be taken possession of under the Land Acquisition Act of 1870, for a main depôt at Byramghát, the centre of the timber trade in Oudh.

Main timber depôts.

90. The Cawnpore and Shahjehanpore depôts have been closed, but no saving has been effected, as the Cawnpore depôt establishment is required at Byramghát; and Shahjehanpore Darogha and peons have been transferred to Shitabaghát, at the mouth of the Sohelí, where the timber outturn of the Khyreeghur forests must be collected and stored until the Korially river is low enough to admit of rafting timber down to Byramghát with safety.

Closing of the Cawnpore and Shahjehanpore Depôts.

SECTION V.

Financial Results.

91. The receipts during the year are for :—

	Rs.	As.	P.
Timber sub-head, I.	2,704	0	0
Miscellaneous, II. to IX., ...	57,477	4	9
Total, ...	60,181	4	9
Deduct expenditure, ...	99,991	7	5
Deficit, ...	39,810	2	8
But the assets of the year exceed the liabilities by, ...	93,181	8	10
Thus, the net surplus of the year 1870-71 is, ...	53,371	6	2

Details of the above are given in the annual statements annexed. Forms Nos. 21 to 28 inclusive.

92. Very little timber was sold during the year under review, partly because the timber in store at Byramghát and Cawnpore was of inferior quality, and could not compete with the Nepal timber, and partly because the market was already glutted with inferior timber brought out from the Oudh forests by dry wood contractors.

Sales.

93. 122 picked logs were sold to the Public Works Department, but the value was not debited in the forest accounts during the year. 180 sound and good logs were made over to the Nowgong Division of the Public Works Department in part

Purchases by Public Works Department.

settlement of an old out-standing account, but the value of this timber, amounting to about Rs. 12,600, has not been debited in the accounts, as the whole Rs. 1,20,000 worth of timber, originally indented for, had been paid for by the Public Works Department, and debited by this Department in full in 1866.

Proposed sale by public auction.

94. An auction sale of the old timber stock will be held at Byramghát after the Executive Engineer, Nowgong, has selected the 300 logs still required to finally close his out-standing account with this Department. The rest of the old stock will be put up at an upset price of eight annas per cubic foot and sold to the highest bidder.

Sales of Minor Forest Produce.

95. The minor forest produce of the Oudh forests were put up to public auction at Kheree, Baraich, and Gondah, but owing to the depressed state of the timber market, fair prices could not be obtained for the dry wood leases except for a few of the forest sections. The other sections were therefore not leased.

Leases in the Baraich Forest unsold.

96. The grazing leases in the Baraich Division, where the mortality amongst cattle had been very great, also the miscellaneous produce leases, were unsaleable for reasonable sums, except in one or two cases.

Direct collection of Minor Forest Revenue.

97. Arrangements were therefore made for the collection of the grazing dues, and for the sale of dry wood and other forest produce, by departmental agency in those sections remaining unleased.

Results.

98. The result of these arrangements, up to the end of August, has been the collection of Rs. 26,821, and may be estimated at Rs. 29,000 by the end of September, which is the last month in the contract year. If this amount is added to the proceeds of the auction sales, as shown in Appendix No. VIII. *viz.*, Rs. 21,730-8-0, the total amount realized for the contract year may be put down at Rs. 50,000, which is not an unfavourable result during a year in which there has been very little demand for inferior timber, and the mortality amongst cattle has been very great.

99. When it is further borne in mind that the arrangements for direct collection were introduced hastily, owing to the unexpected collapse of the contract system, the result may be considered on the whole successful. Some credit is due to Mr. Ponsonby, Assistant Conservator of Forests, in charge of the Baraich Division, in which nine-tenths of the revenue from these sources were collected, for the energetic manner in which he has conducted the kham tahsíl arrangements, and the attention which he has given to its details.

Actual revenue realized from Minor Forest Produce.

100. Actuals of the minnor forest produce Revenue for 1870-71, have been :—

		Rs.	As.	P.
Head	II. } IV. }	20,369	3	7
,,	V.	22,425	12	1
,,	VI.	6,959	2	6
,,	VII.	1,443	2	2
		51,197	4	4

Miscellaneous receipts.

101. The revenue under head IX., miscellaneous, is entered as Rs: 3,951-4-4, but in this are included Rs. 900, erroneously debited to revenue by the Accountant General, and therefore entered as such in the Annual Accounts to make them tally with the figures of the Financial Department.

102. The small receipts under this head IX., miscellaneous, were due to the bad position of the boat ferry, established first at Marouchaghát, where there was very little traffic, and the delay in the transfer of the bridge of boats to Puchpereeghát, adverted to in para. 60.

Cause of falling off in the miscellaneous receipts.

But the returns from the bridge of boats have been over-estimated, even at Puchpereeghát, which is an excellent ferry. The returns for three months were only Rs. 900 or about Rs. 300 per mensem, so that the receipts for one year are not likely to exceed Rs. 3,000.

Returns from bridge of boats over estimated.

103. Recoveries to the amount of Rs. 469-9-11 were made from the old outstanding account of contractors; and the more recent outstandings, due by contractors, have been reduced from Rs. 7,152-13-11 to Rs. 2,778-0-2. A trustworthy man has been employed to collect the old outstanding, and 5 per cent. commission offered as an inducement to exertion. Another portion will be recovered by civil suits; but more than half is totally irrecoverable.

Recoveries of outstandings.

104. The amounts due by rafting contractors have risen from Rs. 4,786-2-6 to Rs. 12,854-3-2, owing to the ill success of floating operations on the Sohelí river during the rains of 1870. More than half of this will it is hoped be adjusted when due credit has been given to the contractors for the value of work actually performed by them, and part of the remainder may be recovered by civil suit, and the sale of their boats. Orders have been issued to that effect.

Amount due by rafting contractors.

SECTION VI.

General Remarks.

105. I am happy to be able to report favourably of all the Officers in charge of Forest Divisions in Oudh, who have all, I believe, done their best to carry out the work assigned to them efficiently and economically.

106. All were at their posts early in November, and all remained out in the forests much later than usual, although the rains set in very early. Mr. Ponsonby stayed out till the beginning of July, Mr. Dodsworth till the middle of June, and Mr. Forrest till the beginning of June, when he left to join his appointment as Assistant Conservator of Forests in Bengal.

107. Mr. Ponsonby inspected all parts of his division, executed most of the line cutting, ditching, and other work ordered to be done, and superintended the collection of the revenue from minor forest produce in a very creditable manner.

108. Mr. Dodsworth had the harassing duty of managing the timber carting operations; extracting sunk logs and snags out of the Sohelí river, and superintending logging operations in the Kheree forests, besides the duty of inspecting different parts of his division. He has done his work with energy, and on the whole as efficiently and economically as circumstances would admit.

109. Mr. Forrest also did his work in the Gondah Division carefully and well, and by his transfer to Bengal, this province has lost the services of a good Forest Officer.

110. Mr. Richardson had charge of the work of rafting and floating the sunk and stranded logs which were recovered in the Sohelí; also the cutting of the important line for timber export from the centre of the 2nd forest sub-division to Khyreeghur, also superintending the collection of Minor Forest Revenue in the unleased forest section. This work he did satisfactorily.

The forest rangers, Moula Bux and Shadee Lal, of the Baraich Division, are very favourably mentioned by Mr. Ponsonby as having ably assisted him in his executive and revenue work. They are therefore deserving of notice in this report and of promotion when provision can be made for it.

Baboo Kunhya Lall, of my office, is an excellent accountant and clerk, and a good surveyor and draftsman. The valuable assistance he has rendered to the Conservator as a head clerk, during the last five years, entitles him to an increase of pay as soon as that can be provided for him.

Baboo Rughoburdyal, of the Kheree office, is well spoken of by Mr. Dodsworth, and Amanatoolah Khan of the Gondah office, by Mr. Forrest; they both deserve an increase of salary.

A re-cast of forest establishment, which provides for a better paid and increased establishment without any additional grant being required, has already been submitted for the sanction of the Chief Commissioner, and will, if passed, add much to the efficiency of the Oudh Forest Department.

111. A complete and authenticated collection of Oudh forest woods and of the flowers, fruit and leaves of the forest trees, was made and presented to the Conservator's office by Mr. R. Thompson, Officiating Deputy Conservator of Forests in the Central Provinces, who was deputed to Oudh to collect botanical specimens and notes of the Oudh Forest Flora, for Dr. Stewart's publication of the "Flora Sylvatica of Northern India." I have already communicated, and here again record, my best thanks to Mr. Thompson for this valuable collection. The list, however, has not yet been received, and cannot therefore be appended to this report.

112. A list of 100 trees, shrubs and plants found in the Oudh forests, and common to the Baraich Division, with remarks on each, has been drawn up by Mr. Ponsonby and is appended No. IX.

113. After Captain Wood's departure to England, in April 1870, on medical certificate, Captain Losack officiated as Conservator till the 18th of June, on which date the undersigned took charge. I was compelled, however, by sickness to proceed to the hills in August, on privilege leave for three months. During that time Captain Losack again officiated. I returned to Lucknow on the 13th November, and held charge of the Oudh forests till the close of the year.

W. STENHOUSE, CAPTAIN,

Fyzabad, 20th September 1871.

Offg. Conservator of Forests, Oudh.

Minute by the Chief Commissioner on the Annual Progress Report of Forests, Oudh, for the year 1870-71.

1. *Para.* 8.—With reference to this para., the Conservator will be informed that his reply to the arguments which the Commissioner of Seetapoor urged against the total closure of the forests during the dry hot season, is awaited.

2. *Para.* 9.—The Conservator should make a separate reference if he thinks special measures necessary to prevent unrestricted grazing.

3. *Paras.* 11 & 12.—Under the seventh of the Forest Rules, permission is granted to *all villagers*, living within three miles, to cut such timber as may be required for their own *bonâ fide* use. And, as under the shield of this rule, Rajás, T'alúkdárs, and Mahájans, cut and remove wood, it is said to require modification; whereas, all that is really required is that it should be strictly enforced against such persons.

4. *Para.* 13.—The Conservator complains that no commission has been appointed to enquire into claims to forest rights or privileges. The Forest Bill, now under the consideration of Government, contemplates the appointment of Commissioners for the purpose indicated, but, until it becomes law, it is not altogether clear what the Conservator wishes to be done and in what manner. In his review of the last year's report, the Chief Commissioner recorded his opinion that a commission for the investigation of these rights might increase, instead of allay, whatever discontent at that time existed. He suggested that the Commissioners of Fyzabad and Seetapoor should deal with such cases, when not cognizable by the courts, in communication with the Conservator.

5. The arrangements entered into between Conservator and the Settlement Officer of Gondah on the one hand, and the Mahárájáh of Bulrampoor and his tenantry on the other, with the view of demarcating and consolidating the Government forests, have been separately considered and are very satisfactory.

6. The proposals in the 24th para., regarding the plan of operations to be pursued in the seventh section of the Baraich forests, should form the subject of a separate reference.

7. With regard to para. 40, I agree with the Conservator that the investiture of Forest Officers with criminal powers would tend to diminish the number of offences against the Forest laws. How far it is expedient to invest an officer, who has a direct interest in procuring the conviction of an accused person, with such powers; in other words, to make him both prosecutor and judge, is another question which will have to be duly weighed in all its bearings when the proper time comes.

8. It does not appear that any reference has been made with regard to rendering the Sohelí navigable in the dry season by means of a dam.

If the project be thought feasible, and, as Conservator says, well worth the outlay, the necessary details should be at once submitted. The same remarks are applicable to the proposals (para. 59) to erect permanent timber bridges across the Sohelí; and (para. 62) to maintain a fleet of departmental canoes.

9. The net surplus revenue of the year after paying expenses is said to be Rs. 53,371. In 1869-70 it was Rs. 43,553, so that there has been a gain over the previous year of Rs. 9,818. But the Conservator is in error when he states (para. 110) that his proposed recast of establishment will not require any additional grant. It was on that very point that its consideration was postponed.

10. I have noticed what Captain Stenhouse says of his subordinates, and think that in him this administration has an efficient and energetic Conservator of Forests.

LUCKNOW:
The 20th October 1871.

GEORGE COUPER,
Officiating Chief Commissioner, Oudh.

No. 21.

Forest Department, Oudh.

ANNUAL SUMMARY OF REVENUE EXPENDITURE IN THE DIFFERENT DIVISIONS DURING 1870-71.

Classification.	Direction.	Khereo.	Baraich.	Gondah.	Total.
Receipts.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As. P
I. Sale of Timber at Depôts, ...	...	2,704 0 0	...	...	2,704 0 0
II. Sale of Timber removed by purchasers, ...	...	10,102 2 0	5,720 8 0	4,546 9 7	20,369 3 [illegible]
III. Duty on foreign timber, ...	...	...	...	...	...
IV. Permit fees, ...	...	60 0 0	753 8 0	1,145 5 4	1,958 13 [illegible]
V. Grazing dues, ...	...	5,214 4 0	14,817 9 1	2,393 15 0	22,425 12 1
VI. Sale of fruits, &c., ...	...	792 7 6	3,757 9 0	2,409 2 0	6,959 2 6
VII. Sale of confiscated timber, ...	...	141 10 8	748 8 0	552 15 6	1,443 2 2
VIII. Fines and forfeitures, ...	...	154 13 11	210 8 10	4 8 0	369 14 9
IX. Miscellaneous, ...	45 0 0	3,858 3 4	38 1 0	10 0 0	3,951 4 4
Total Receipts, ...	45 0 0	23,027 9 5	26,046 3 11	11,062 7 5	60,181 4 9
Conservancy and Working.					
I. Timber expenses, ...	...	35,643 7 10	...	...	35,643 7 10
II. Purchases of stock and cattle, ...	274 3 6	518 8 11	85 5 3	15 2 8	893 4 4
III. Feed and keep of cattle, ...	216 1 0	1,653 3 11	465 2 8	396 1 6	2,730 9 1
IV. Rent of leased Forests, ...	...	...	...	...	...
V. Charges in collecting revenue on grass, &c., ...	...	197 13 0	107 4 4	15 0 0	320 1 4
VI. Plantations, ...	...	423 1 6	...	68 14 0	491 15 6
VII. Forest work, ...	...	2,321 13 6	1,165 1 7	163 0 8	3,649 15 9
VIII. Forest survey, ...	1 0 0	219 7 8	46 5 6	4 10 4	271 7 2
IX. Experiments on timber, ...	...	7 0 9	...	...	7 0 9
X. Communications and buildings, ...	...	7,769 7 7	7,46 9 0	348 7 7	8,864 8 2
Total Conservancy and Working, ...	491 4 6	48,754 0 8	2,615 12 4	1,011 4 5	52,872 5 11
Establishments.					
I. Salaries, ...	8,122 3 5	16,659 14 1	8,091 12 0	4,815 7 9	37,689 5 3
II. Allowances, ...	1,287 15 10	2,252 9 6	1,812 13 6	978 6 9	6,331 13 7
III. Contingencies, ...	688 3 11	1,448 9 6	480 8 1	480 9 2	3,097 14 8
Total Establishment, ...	10,098 7 2	20,361 1 1	10,385 1 7	6,274 7 8	47,119 1 6
Grand Total Expenditure, ...	10,589 11 8	69,115 1 9	13,000 13 11	7,285 12 1	99,991 7 5

W. STENHOUSE, CAPTAIN,
Offg. Conservator of Forests, Oudh.

No. 22.

Forest Department, Oudh.

Dr. ANNUAL ABSTRACT ACCOUNT OF THE CASH TRANSACTIONS OF THE FOREST DEPARTMENT IN THE YEAR 1870-71. **Cr.**

Year.	Heads of Account.	Rupees.			Year	Heads of Account.	Rupees.		
1870-71.	To cash balance in hand on 1st April 1870, ...	19,741	1	11	1870-71.	By Cost of medicine from Military Department,... ...	108	14	0 A. II.
	„ Revenue received, ...	59,281	4	9		„ Official postage, ...	303	3	3 B. III.
		900	0	0					
	„ Remittances from State Treasuries, ...	99,882	4	4		„ Expenditure of the Department, ...	95,931	5	8
		3,215	5	6			3,648	0	6
	„ Deposits received, ...	471	6	10		„ Objectionable items included under expenditure, ...	704	5	4
	„ Advances recovered, ...	59,024	7	5		„ Remittances to State Treasuries,...	59,978	0	8
		100	0	0					
	„ Cash recovery of old outstandings, ...	50	11	5		„ Deposits repaid, ...	65	8	0
	„ Madras Military fund received, ...	109	2	0		„ Advances made, ...	67,493	1	8
		12	2	0			1,000	0	0
	„ Income Tax received, ...	737	7	1		„ Refund of revenue, ...	954	11	3
	„ Government of India, ...	28	15	0		„ Proforma entry in adjustment of the erroneous credit under "advances recovered" in accounts for 1869-70, and credited to revenue under head IX, by order of the Accountant General,	1,202	1	4
	„ U. S. F. P. Fund, ...	72	10	0					
	„ Value of medicine from Military Department,... ...	108	14	0					
	„ Official postage, ...	303	3	3		Total, ...	2,31,389	3	8
						Cash balance in hand on 31st March 1871,...	12,649	11	10
	Total, ...	2,44,038	15	6		Grand total, ...	2,44,038	15	6

W. STENHOUSE, CAPTAIN,

Offg. Conservator of Forests, Oudh.

No. 23.

Forest Department.

ANNUAL STATEMENT OF OUTSTANDINGS AND LIABILITIES OF THE DEPARTMENT ON ACCOUNT OF CONTRACTORS AND DISBURSERS.

Value of Timber Stock.				Rs. A. P.		Rs. A. P.	
Shahjehanpoor Depôt, logs,	53 @ 40 0	Cubic feet.	@	1 0 0	per cub. foot.	2,120 0 0	
Cawnpore, „	366 @ 40 0	Ditto,	@	1 0 0	Ditto,	14,640 0 0	
Khujooria, „	13 @ 40 0	Ditto,	@	0 10 0	Ditto,	325 0 0	
In Sarda, in transit, „	419 @ 40 0	Ditto,	@	0 12 0	Ditto,	12,570 0 0	
Sohelí Depôts, „	6,498 @ 40 0	Ditto,	@	0 8 0	Ditto,	1,29,960 0 0	
In Sohelí in transit, „	1,755 @ 40 0	Ditto,	@	0 8 0	Ditto,	35,100 0 0	
Byramghát Depôt, „	1,133 @ 40 0	Ditto,	@	0 14 0	Ditto,	39,655 0 0	
Total logs,	10,237						
Sardah Sleepers, ...	242 @ 5 0	Ditto, each	@	2 8 0	each,	605 0 0	
Cawnpore „ ...	233 @ 5 0	Ditto, „	@	3 12 0	„	873 12 0	2,35,848 0 0
Total Sleepers, ...	475						

Division.	Department Debtor.			Department Creditor.			Balances due.	
	At commencement of year 1870-71.	Recoveries in cash and value of supplies and work done during year 1870-71.	At close of year 1870-71.	At commencement of year 1870-71.	Payments made during year 1870-71	At close of year 1870-71.	To Department (Outstandings.)	By Department (Liabilities.)
Outstandings on Account of Sales.								
Mohesh Chunder, timber Merchant, ...	...	...	...	2,400 0 0	...	2,400 0 0	2,400 0 0	...
Executive Engineer, Nowgong Division, P. W. D. ...	23,548 6 3	...	23,548 6 3	...	9,476 14 3	9,476 14 3	...	14,071 8 0
Executive Engineer, 2nd O. Roads Division, ...	...	...	...	...	1,258 9 9	1,258 9 9	1,258 9 9	...
Executive Engineer, Seetapoor, ...	...	.	...	...	4,028 7 10	4,028 7 10	4,028 7 10	...
Deputy Commissioner, Kheree,	675 0 0	279 11 3	954 11 3	...	954 11 3	954 11 3	...	...
Total, ...	24,223 6 3	279 11 3	24,503 1 6	2,400 0 0	15,718 11 1	39,718 11 1	7,687 1 7	14,071 8 0
Excess Payments to Contractors.								
Kheree Division, old account,	...	469 9 11	469 9 11	20,510 6 10	...	20,510 6 10	20,040 12 11	...
„ new account, carters,	...	24,347 9 6	24,347, 9 6	7,152 13 11	19,972 11 9	27,125 9 8	2,778 0 2	...
„ , rafters,	...	1,677 0 0	1,677 0 0	4,786 2 6	9,745 0 8	14,531 3 2	12,854 3 2	...
Advances to Forest Subordinates for Works, ...	...	59,124 7 5	59,124 7 5	...	68,493 1 8	68,493 1 8	9,368 10 3	...
Total, ...	...	85,618 10 10	85,618 10 10	32,449 7 3	98,210 14 1	1,30,660 5 4	45,041 10 6	...
Grand total, ...	...	...	...	...	...	...	2,88,577 8 1	14,071 8 0

W. STENHOUSE, CAPTAIN,

Offg. Conservator of Forests, Oudh.

No. 24.

Forest Department, Oudh.

STATEMENT OF TIMBER BROUGHT TO DEPOTS FROM THE DIFFERENT FOREST DIVISIONS, DURING 1870-71.

Name of River or Division.	Forest.	Description of Timber.	Pieces.	Cubic feet.	Totals of each River.		Remarks.
					Pieces.	Cubic feet.	
Kheree Division, ...	Khyree-gurh forest,	Sál and a few Asna and Huldoo,	Logs. 5,788	2,31,520			
Ditto,	Ditto,	Pieces, sleeper size, ...	235,	3,525,	6,023	2,35,045	

W. STENHOUSE, CAPTAIN,

Offg. Conservator of Forests, Oudh.

No. 25.

Forest Department, Oudh.

ANNUAL TIMBER ACCOUNT FOR 1870-71.

Particulars.	Pieces.	Totals.
	Sal logs.	
I.—Stock in hand at the following Depôts at the commencement of the year :—		
Shahjehanpoor Depôt, ... In Ramgunga, ...	54	
„ Gurra, ...	70½	
„ Villages, ...	33	
„ Transit, ...	206½	
At Cawnpore, ...	250	614
Sardah, ... „ Khujooria, ...	13	
In Transit to Byramghát, ...	526	539
Sohelí, ... At Suthiana Depôt, ...	2,001	
„ Doodooa, ...	823	
„ Bundee,...	41	
In Transit, ...	152	
At Byramghát, ...	561	3,578
		4,731
II.—Timber received at Depôts from the forests, sal and a few asna and huldoo logs, ...	...	5,788
Timber received at Depôts from the forest, pieces sleeper size, ...	...	235
	Sal Sleepers.	10,754
I.—Stock in hand :—		
At Cawnpore Depôt, ...	241	
„ Roodpoor Village, ...	6	
„ Pipuria „	4	
„ Sherpoor, „	12	
„ Diggeaghát Depôt, ...	462	725
II.—Timber received at Depôts, ...	...	...
		725
Total Pieces, ...	Sal logs.	10,754
	„ Sleepers	725

Particulars.	Pieces.	Totals.
	Sal logs.	
I.—Timber removed by purchasers from Depôts :	412	412
II.—Timber lost :—		
In Ramgunga, ...	35	
„ Gurra, ...	70	105
III.—Timber in hand at the close of the year at the following Depôts :—		
Shahjehanpoor Depôts ... At Cawnpore Depôts, ...	366	
„ Shahjehanpoor, „	2	
„ Chubramow, „	21	
In Villages, ...	10	
„ Transit to Cawnpore, ...	20	
Sardah, „ ... At Khujooria, „	13	
In Transit to Byramghát, ...	419	
At Suthiana, „	5,741	
„ Doodooa, „	531	
„ Bundee, „	226	
„ Byram Ghat, „	1,133	
In Transit to Byramghát, ...	1,755	10,237
		10,754
I.—Timber removed by purchasers :—	Sál Sleepers.	
II.—Timber lost :—		
In Kunhout, ...	22	
Used in making handspikes for removing logs,	8	
„ Bridge of boats	220	250
III.—Stock in hand :—		
At Cawnpore Depôt, ...	233	
„ Puchperee „	242	475
		725
Total Pieces, ...	Sal Logs	10,754
	„ Sleepers	725

NOTE.—About 80 or 100 of the logs shown as in transit are not recoverable, being sunk in the river Sohelí.

W. STENHOUSE, CAPTAIN,
Offg. Conservator of Forests, Oudh.

No. 26.

Forest Department, Oudh.

STATEMENT SHOWING THE AMOUNT REALIZED ON ACCOUNT OF THE DIFFERENT CLASSES OF TIMBER SOLD DURING 1870-71.

Divisions.	Number of logs sold.	Cubical contents.	Amount realised and due on account of timber sold.	Average amount per log.	Average cubical contents of logs.	Average amount per 100 cubic feet.
KHEREE.		Cubic feet.	Rs. As. P.	Rs. As. P.	Cubic feet.	Rs. As. P.
Executive Engineer, 2nd Oudh Road Division	22	932·75	1,258 9 9	57 3 4	42·39	134 15 6
Ditto ditto Seetapoor, ...	100	5,371·26	4,028 7 10	40 4 6	53·71	75 0 0
Ditto ditto Nowgong, ...	180	8,539·0	0 0 0	71 0 0	48·00	150 0 0
Gopee and Mohun, ...	90	...	2,700 0 0	30 0 0	...	...
Butt ends, ...	...	...	4 0 0	...	...	...
Total, ...	392	14,843·01	7,991 1 7	...	...	...

Remarks.	Pieces.
Timber sold in previous years remaining un-removed at the commencement of the year.	136
Timber sold during the year, ...	392
Total, ...	528
Timber remaining unremoved at the close of the year.	116
Balance removed from depôts by purchasers during the year, ...	412

Deduct amount due, but not realized during the year,...	5,287 1 7
Balance, ...	2,704 0 0
Add amount realized on account of former years, ...	0 0 0
Total shown as revenue on account of timber sales, ...	2,704 0 0

No. 27.

Forest Department, Oudh.

STATEMENT SHOWING THE AMOUNT EXPENDED ON ACCOUNT OF TIMBER RECEIVED FROM THE DIFFERENT FOREST DIVISIONS DURING 1870-71 .

Name of Division.	No. of Logs.	Cubical contents.	Timber expenses.	Add 1-21th share of total Conservancy Expenses, cost of Establishment, &c., of the Deposit.	Total amount expended.	Average amount paid per Log.	Average cubical contents per Log.	Average amount paid per 100 cubic feet.	Remarks
Kheree Division, ...	Logs. 5,788	2,31,520	35,643 7 10	*3,064 3 0	38,707 10 10	6 9 5	40 c. feet,	16 7 6	
	Pieces. 235	3,525				2 7 6	15 c. feet		

Abstract rate per 100 cubic foot.

	1870-71.
Timber Expenses, ...	15 2 7
Conservancy and Establishment, 1-21th of whole.	1 4 11
Total, ...	16 7 6

* The proportion of forest conservancy and establishment charges chargeable to the timber brought out on Government account is estimated at one twenty-oneth part of the whole expenditure under these heads, because the proportion of the revenue under head I. to the revenue from other sources is about 1 : 21.

W. STENHOUSE, CAPTAIN,
Offg. Conservator of Forests, Oudh.

No. 28

Forest Department, Oudh.

ANNUAL ACCOUNT OF FOREST REVENUE FOR THE YEAR 1870-71.

Receipts, ...	60,181	4	9
Expenditure,...	99,991	7	5
DEFICIT.	39,810	2	8
Add difference between assets and liabilities at the commencement and close of the year, ...	93,181	8	10
Net Revenue, ...	53,371	6	2

Detail of difference between assets and liabilities at the commencement and close of the year.

	At the commencement of the year.	At the close of the year.	Difference.	
			In favour of the year.	Against the year.
	Rs.	Rs.	Rs.	Rs.
Value of Timber stock, ...	1,46,475 0 0	2,35,848 12 0	89,373 12 0	... ...
Outstanding on account of sales	2,400 0 0	7,687 1 7	5,287, 1 7	... ...
Excess payments to Contractors, ...	32,449 7 3	45,041 10 6	12,592 3 3	... ...
Total assets, ...	... ...	... ...	1,07,253 0 10	... ...
Deduct liabilities, ...	... ...	... ...	14,071 8 0	... ...
Balance ...	... ...	... ...	93,181 8 10	... ...

W STENHOUSE, CAPTAIN,

Offg. Conservator of Forests, Oudh.

APPENDIX II.

List of Grants in the Gondah District bordering on the Kuano and Chumnai streams.

Name of Nuddie.	Number of grants.	Parganah.	Name of grant.	Name of grant.	Area in acres.	Remarks.
Kuano, ..	1	Balrámpúr, ..	Mahárajganj, ..	M. R. of Balrampúr, ..	...	Granted to the Maharaja of Balrampúr.
Ditto, ..	2	Ditto, ..	Lallpúr, ..	Ditto, ..	...	Ditto.
Ditto, ..	3	Gondah, ..	Pirthepalganj, ..	Thakúrain Surfráz Kooer,	2,423	Held under rules of 1860.
Ditto, ..	4	Ditto, ..	Ganeshpúr, ..	Rajáh Keshen Dut, ..	710	Ditto.
Ditto, ..	5	Ditto, ..	Tirbohunnuggar, ..	Ditto, ..	2,254	Ditto.
Ditto, ..	6	Atraula, ..	Kooawa, ..	Gopál and Dhumree, ..	413	Ditto.
Ditto, ..	7	Ditto, ..	Goomree, ..	Radhá Kishen Dut, ..	646	Under new rules.
Ditto, ..	8	Ditto, ..	Gowr, ..	Ditto, ..	676	Ditto,
Ditto, ..	9	Ditto, ..	Bhulwar, ..	Wazeer Khán, ..	542	Under rules of 1860.
Ditto, ..	10	Ditto, ..	Jafferabad, ..	Muntaz Alí Khán, ..	781	Under new rules.
Ditto, ..	11	Ditto, ..	Pukree, ..	Radhá Shree Bahádur, ..	1,036	Ditto.
Ditto, ..	12	Ditto, ..	Etaie, ..	Radhá Keshen Dut, .	951	Ditto.
Ditto, ..	13	Ditto, ..	Ramgurh, ..	Ditto, ..	1,154	Ditto.
Ditto, ..	14	Ditto, ..	Gujpúr, ..	Motí Rám of Bulrampúr, ..	2,062	Ditto.
Ditto, ..	15	Sádullanagar, ..	Biaskooeah, ..	Radhá Keshen Dut, ..	951	Ditto.
Ditto, ..	16	Ditto, ..	Bundrahah, ..	Babú Goor Charun, ..	2,652	Ditto,
Ditto, ..	17	Burapira, ..	Saunkpúr, ..	R. Oodit Pergas Singh, ..	1,383	Under old rules.
Ditto, ..	18	Ditto, ..	Sugrugurh, ..	Ditto, ..	144	Ditto.
Ditto, ..	19	Ditto, ..	Hameerpúr, ..	Ditto, .	1,769	Ditto.
Ditto, ..	20	Ditto, ..	Sonoonai, ..	Ditto, ..	956	Ditto.
Ditto, ..	21	Ditto, ..	Cooknuggur, ..	Mr. William Cook, ..	5,000	Ditto.
Chumnai, ..	22	Máhádewa, ..	Oodeypúr, ..	Buljrutten Singh, ..	733	Ditto.
Ditto, ..	23	Ditto, ..	Ganeshpúr *alias* Goura, ..	R. Keshen Dut, ..	1,479	Under new rules.
Ditto, ..	24	Nawabganj, ..	Pertab Singh, Fort, ..	Ditto, ..	1,479	Dittto.
Ditto, ..	25	Dittc, ..	Ramgurh, ..	Government, ..	3,057	
Ditto, ..	26	Ditto, ..	Dabinugger, ..	Dabídeen and Ramdeen, ..	1,045	Under old rules.
Ditto, ..	27	Ditto, ..	Laidhainna, ..	Lieutenant Carmichael, ..	1,651	Of this, 155 acres 13 poles under fee simple and the rest under rules of 1860.
Ditto, ..	28	Ditto, ..	Chittowna, ..	Mr. Glynn, ..	1,574	Under old rules.

(Signed,) R. H. DEMONTMORENCY,

Offg. Deputy Commissioner.

GONDAH:

The 12th September 1871.

APPENDIX IV.—(*Continued.*)

Name.	English name.	Quantity.	Rate given in Appendix III. annual report for 1867-68.	Present rate in Baraich Division.	Remarks.
	VI.—*Continued.*				
Moom, ...	Wax,	Per seer.	0 0 9	...	Hitherto given in contract.
Koolaindee Mahúá, ...	Mahooá Seeds,	Per maund.	1 0 0	...	
Phool Toon, ...	Toon flowers,	Ditto.	2 0 0	...	
Do. Dhak, ...	Dhak,	Per seer.	0 0 1	...	
Singhara, ...	Water nut,	Per maund.	0 4 0	...	
Khuskhus, ...	Grass root for Tatties.	Ditto.	0 4 0	...	
Poola Ghass, ...	Thatching grass,	Head load.	0 0 6	...	Never sold; rate charged by Contractor one rupee for 400 bundles, and the purchasers are allowed to take it away in carts.
Ditto, ...	Ditto,	Horse or Buffalo.	0 0 9	...	
Ditto, ...	Ditto,	Cart, 2 ox.	0 3 0	...	
Ditto, ...	Ditto,	„ 3 „	0 4 0	...	
Ditto, ...	Ditto,	„ 4 „	0 6 0	...	
Baid or Saintha, ...	Cane or reed grass	Head load.	0 0 6	...	Formerly given in contract, also this year in petty contract.
Ditto, ...	Ditto,	Bhangy.	0 1 6	...	
Ditto, ...	Ditto,	Horse or Buffalo.	0 2 0	...	
Ditto, ...	Ditto,	Cart, 2 ox.	0 8 0	...	
Ditto, ...	Ditto,	„ 3 „	0 12 0	...	
Ditto, ...	Ditto,	„ 4 „	1 0 0	...	
Baid, ...	Cane,	„ 2 „	1 0 0	...	Not allowed to be cut.
Ditto, ...	Ditto,	„ 4 „	2 0 0	...	
Bans, ...	Bamboos,	„ 2 „	0 8 0	...	
Ditto, ...	Ditto,	„ 4 „	1 0 0	...	
Moonj and Sirkee, ...	Sacharum Moonja and its upper reed.	Head load.	0 0 9	...	Given in contract.
Ditto, ...	Ditto,	Bhangy.	0 1 6	...	
Ditto, ...	Ditto,	Horse or Buffalo.	0 2 0	...	
Ditto, ...	Ditto,	Cart, 2 ox.	0 12 0	...	
Ditto, ...	Ditto,	„ 3 „	1 0 0	...	
Ditto, ...	Ditto,	„ 4 „	1 4 0	...	
Bunkus, ...	... ...	Head load.	0 1 0	0 2 0	On contract to M. of Bulrampoor, who charges 2 annas.
Ditto, ...	... ...	Bhangy.	0 1 6	...	
Ditto, ...	... ...	Horse or Buffalo.	0 2 0	...	
Ditto, ...	... ...	Cart, 2 ox.	1 0 0	...	
Ditto, ...	... ...	„ 3 „	1 8 0	...	
Ditto, ...	... ...	„ 4 „	2 0 0	...	
Chataee Narkúl, ...	Reed mat,	Head load.	0 1 0	...	Sold at 2 rupees a hundred.
Ditto, ...	Ditto,	Bhangy.	0 2 0	...	

APPENDIX IV.—(*Continued.*)

Name.	English name.	Quantity.	Rate given in Appendix III. annual report for 1867-68.	Present rate in Baraich Division.	Remarks.
	VI.—*Continued.*				
Chatáce Norkúl, ...	Reed mat,	Cart, 2 ox.	0 6 0	...	Sold at 2 rupees a hundred.
Ditto, ...	Ditto,	„ 3 „	0 8 0	...	
Ditto, ...	Ditto,	„ 4 „	0 12 0	...	
Kalums or Naizá, ...	Native Pens,	„ 2 „	1 0 0	...	Formerly on contract only found in 8th section.
Ditto, ...	Ditto,	„ 4 „	2 0 0	...	
Kumaila or Rohince, ...	... ...	Per seer.	0 0 3	...	
Peepla Mooáh, ...	... ...	Ditto.	0 0 3	...	Given on contract formerly.
Hur, Baherá, Aonla or Tirfala, ...	... ...	Ditto.	0 0 1	...	
Kakrá Singhee, ...	... ...	Ditto.	0 0 2	...	
Kapoor Kuchree, ...	... ...	Per maund.	0 2 0	...	
Nagun Móthá, ...	Sweet smelling or cyperus porteunis	Ditto.	0 8 0	...	
Kunwal gutta, ...	Lotus seed,	Ditto.	1 0 0	...	
Kasoiroo, ...	Root cyperus tuberosus.	Ditto.	0 4 0	...	
Ruttun Jote, ...	... ...	Ditto.	0 8 0	...	
Sitawar, ...	... ...	Ditto.	0 8 0	...	
Mooslee Semal, ...	Semal root,	Ditto.	0 8 0	...	
Do. white and black, ...	Ditto,	Ditto.	0 8 0	...	
Bilace Kund, ...	... ...	Per maund.	0 4 0	...	
Mynful, ...	... ...	Ditto.	0 4 0	...	
Peepal, ...	Long pepper,	Per seer.	0 0 6	...	
	IX.				
Bunghae, ...	Wild cattle,	Each.	2 0 0	5 0 0	
Muchlee, ...	Fish,	Per maund.	0 8 0	...	Not reserved, free.
Moorgabee, ...	Teal,	Each.	0 0 3	...	
Churra Gái Bhains, ...	Hides,	Ditto.	0 2 0	...	2 Rupees a village; given on contract.
Do. Hurnee, ...	Ditto Deer,	Ditto.	0 1 0	...	
Seong Bhains, &c., ...	Buffalo horns,	Per seer.	0 0 3	...	
Ditto, ...	Ditto,	Cart, 2 ox.	1 0 0	...	
Ditto, ...	Ditto,	„ 4 „	2 0 0	...	
Ditto Hurnee, ...	Deers' horns,	Pair.	0 0 3	...	
Choona, ...	Stone lime,	Cart, 2 ox.	0 4 0	...	On contract, no purchaser as yet.
Ditto, ...	Ditto,	„ 3 „	0 6 0	...	
Ditto, ...	Ditto,	„ 4 „	0 8 0	...	
Boats per hollow, ...	... ...	.....	...	...	
Sakhoo trees, ...	... ...	.....	15 0 0	...	Each hollow tree standing.

W. STENHOUSE, CAPTAIN,
Offg. Conservator of Forests, Oudh.

APPENDIX No. V.

List of Forest cases tried in the Districts of Kheree, Baraich, and Gondah, during the Financial year 1870-71.

Number.	Name, residence and occupation of accused.	Date and locality where the offence is stated to have been committed.	Nature and description of offence.	Nature of evidence.	Nature of sentence.	Sentence.	Commutation of punishment.	Remarks.
1	Punna Sah, of Pulha.	23rd July 1870, Govt. Forests	Theft of Government wood.	Proved by witness.	Rigorous imprisonment.	4 months	..	...
2	Badal.	7th Sept. 1870.	Ditto.	Ditto.	Ditto.	15 days.	...	...
3	Lultoo and Sukha.	19th Sept. 1870.	Ditto.	Ditto.	Stripes.	15 stripes	..	..
						G. RICHARDSON, *Sub-Asst. Conservator of Forests in charge of Kheree Division, Oudh.*		
1	1 Ram Surun Lall, of Tanda, servant of Rugnundun Singh, T'alukdár. 2 Kalay Khan, resident of Seetapoor, servant of ditto.	Occurred about 28th January 1870, at Nishangoree.	Defendants were charged of taking away 30 maunds of dhan, produce of Government forest.	The evidence was directed to the charge, but it was proved that the produce of the land was always taken by the T'alukdár, the employer of defendants.	...		...	Acquitted.
2	Jankee, Thicahdar of Chhotugaoon	Occurred about 2nd March 1870, at Churdah.	Defendant was charged with having in his possession some Sakoo wood, cut from the Government forest without permission.	The wood was recovered from the defendant's house.		Rs 50 fine.	In default of fine, 3 month's imprisonment	Fine realized.
3	Bhowanigeer, servant.	Defendant was charged with having taken away a Government log from Gopeepoor about 17th April 1871.		It was not proved by the evidence that the logs carried by the defendant belonged to Government.	...		.	Discharged.
4	Mohamud Khan, a Chuprasee of Nanpara Tehsil.	Chukeea, March 1871.	Cutting green Sakoo.	It was proved that the defendant did not cut any wood from Government forest, but got some wood by permission of Thicahdar.		.	...	Ditto
5	Lutchman Purshud.	Occurred at Motipoor, about 21st of April 1870.	Taking four logs from Government forest.	The wood reported to be Government property, was seen in the possession of defendant.	.	Rs 100 fine	In default 4 month's simple imprisonment.	The fine was not realized. The accused was discharged in appeal.
6	Usgur Hoosein, a contractor resident of Nanpara.	Niddupoorwah, June 1870.	Cutting green wood.	A cart loaded with some green wood was seen by the Assistant Commissioner but it was not proved that defendent cut the wood or the cart was his.	...		...	Discharged.
7	Gunga Kahar, of Hurkapoor.	Soojowlie, about 31st May 1870	Cutting Sal wood.	The defendant himself admitted this and a witness deposed to the fact.	...	Rs. 10 fine.	In default one month's simple imprisonment.	Fine realized.
8	Sookha Ram, Aheer, of Dowlutpoor Ilaka, Nanpara	Occurred at Soojowlie, about 1st June 1870.	Setting fire to Govt. forest.	A boy was an eye witness to the fact.	...	2 month's simple imprisonment.	...	...
9	1 Neerhoo 2 Byjoo 3 Nunno and 4 Bendershoree.	Bingah, about March 1870.	Taking some wood from Government forest.	It was found that the defendants got the wood by permission of a contractor.	...	...	...	Discharged.
10	Ooday Gurrie, of Busuntpoor,	Beehooa, about March 1870.	Cutting green trees.	Defendant admitted his guilt.	..	Rs. 14 fine.	In default, 2 month's simple imprisonment.	Fine realized.
11	Ramdeen.	Beehooa, June 1870.	Setting fire in Government forest	There was no proof in the case.	...	...	...	Discharged.

APPENDIX No. V.—(*Continued.*)

Number.	Name, residence, and occupation of accused.	Date and locality where the offence is stated to have been committed.	Nature and description of offence.	Nature of evidence.	Nature of sentence	Sentence.	Commutation of punishment.	Remarks.
12	Beeharee and Mungray.	Bechoon, 27th February 1871.	Taking wood from Govt. forest without permission.	Defendants admitted that they took some dry wood from the forest.	...	1 anna fine each.	...	Fine realized.
13	1 Doonia Sing, of Churdah 2 Prog Sing, of Churdah.	Churdah, April 1870.	Cutting green sakoo wood.	The wood was found in the defendant's possession.	...	3 month's rigorous imprisonment.	...	...
14	Hoossainee.	September 1870.	Cutting green wood.	There were eye witnesses to the fact.	...	2 month's simple imprisonment.	...	...
15	Beeharee, Koormee of Umbapore.	Beehipoorah, 31st August 1870.	Ditto.	Defendant seen by the witness. Defendant admitted his guilt.	...	Rs. 10 fine.	In default one month's simple imprisonment	Fine realized.
16	1 Nihál Singh, of Sewpoora, and 2 Purseennee, of ditto.	Chuckeea, 29th October 1870.	Taking wood from the Government forest without permission.	Defendants were seen in the act by a forester. Defendants admitted their guilt.	...	Rs. 2 fine each.	In default 15 days' simple imprisonment	Fine realized.
17	Anunt Lodh, of Kukroha.	Motipur, 20th December 1870.	Cutting green wood.	2 Villagers saw the defendant going into the forest and informed the forester. Defendant admitted his guilt.	...	2 month's simple imprisonment.	...	...
18	Jankee Lal.	Bulsingpur, February 1871.	Cutting some wood from Government forest.	Accused admitted his guilt.	...	Rs. 10 fine.	In default one month's simple imprisonment.	Fine realized.
19	Bhoodhnee.	Perwannah Gowree, February 1871.	Taking away some wood from Government forest.	The defendant was seen by the Assistant Conservator, while he was taking some wood from the Government forest.	...	Rs. 10 fine.	Ditto.	Fine realized.
20	Runjet Sing.	Soodnah, February 1871.	Having in possession some wood of Government forest.	On search of defendant's house in a case of theft, the wood was found. Accused admitted cutting the wood.	...	Rs. 5 fine.	One month simple imprisonment.	Ditto.
21	Dabee.	February 1871.	Cutting wood in Government forest.	Accused admitted his guilt	...	Rs. 2 fine.	One month simple imprisonment.	Ditto.
22	1 Khooda Bux. 2 Goordeen. 3 Inderjeet.	March 1871.	Making away with some ebony wood	The accused were seen by the Assistant Conservator taking away the wood.	...	No. 1, Rs. 5 fine. No. 2, Rs. 20 fine No. 3, Rs. 5 fine.	...	Fine realized.
23	Shium Sing, Punjabee.	March 1871.	Cutting an ebony tree.	Accused admitted his guilt.	...	Rs. 2 fine.	In default 2 weeks' simple imprisonment	Fine realized.
24	Ramsahai.	Motipur, March 1871.	Cutting wood.	The wood was a dry one.	...	...	...	Discharged.
25	Ram Churn.	Esanugger, 3rd March 1871.	Collecting Kham Tehsil grazing dues.	Proved he did not actually collect, but intended to do so.	...	6 months' imprisonment.	...	Now in jail.

(Signed) W. C. WOOD,
Offg. Dy. Commissioner, Baraich.

1	Buldew, Bhawanee and Gunga.	15th September 1870.	Cutting Sheshem wood.	Proved by witness.	...	2 months' imprisonment.	...	
2	Jurruk.	25th February 1871.	Lopping of trees for grazing purposes.	Ditto.	...	Rs. 5 fine.	In default of payment, one month's imprisonment.	
3	Dator.	26th February 1871.	Ditto.	Ditto.	...	Rs. 3 fine.	In default of payment 15 days' imprisonment.	
4	Sukut.	27th February 1871.	Ditto.	Ditto.	...	Rs. 2 fine.	Ditto.	
5	Toolsiram, Ayjudia, Jusiuk and Pultoo.	3rd March 1871.	Theft Government Timber from forest.	Ditto.	...	Two fined Rs. 5 two fined Rs. 2-8	In default of payment each 15 days' imprisonment.	
6	Ameer, Munsor and Sumun.	8th March 1871.	Ditto.	Ditto		Each fined Rs. 2.	In default of payment 15 days' imprisonment.	

(Sd.) E. FORREST,
Sub-Assistant Conservator, Oudh Forests, Gondah Division.

APPENDIX No. VI.

SPECIFICATION.

Out of the total width of 110 feet, at the top of river, 30 feet, or 15 on either side, will be shut off by earthen banks protected with fascines, leaving 80 feet on average width of winter stream, for the length of regulating dam. It is proposed to divide these 80 feet as follows :—In the middle there will be an opening of 20 feet, to centre of piers, with the regulating gates, through which all the timber will pass, and as it will also have to bear the rush of water when the gates are opened, it will be constructed of pucka masonry with concrete floors to be hereafter described ; the remaining 30 feet on either side of the above will be divided into three spans each and will have timber piers, with regulating planks sliding into grooves, the advantages of which will be presently considered.

The dam is for the purpose of regulating the river which runs exceedingly low in the winter, with a velocity hardly perceptible, the fall being but about one foot in the mile, and renders the floating down of timber expensive and laborious, large sums having to be spent in clearing away silt and rubbish naturally deposited by a stream with so small a velocity. By the construction of the dam, the water will be shut off and allowed to rise to a height of 12½ feet, which will throw back the water for some 5 miles on the upstream side, at which point the timber will be ready for floating down. As soon as the water has reached the required level, the gates will be gradually opened out, and the timber allowed to float down the stream, which will now have a considerable velocity and a good depth of water. It must be borne in mind, however, that the water can never be allowed to overtop the dam as there is no floor between the timber piers, and with a fall of 13 feet, the water would, in a few minutes cause a deep scour and destroy the said piers. The object of having a regulating dam is to give the river a free course during the rainy season and to confine the stream in the winter to any space necessary.

The dam as above described will be a permanent and comparatively cheap one, the only portion liable to injury being the timber piers, from any unlooked for scour, but should it be found necessary a floor of timber and boulders can easily be added on at no great expense.

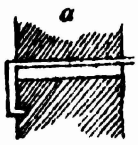
The masonry piers of the centre portion will rest on 5 feet wells sunk to a depth of 12 feet and filled with concrete. The masonry of these wells will be 1 foot thick and composed of pucka bricks laid in mortar of 2 parts good coarse sand or soorkhee, 1 part kunkur lime, and 1 part stone lime, or any such mixture that may be found to set well under water, and must depend on the materials available in the neighbourhood.

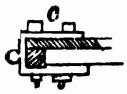
The concrete will consist of broken brick of a size not larger than 1½ inch square, and the same mortar as will be used for the masonry, in the proportion of 5 to 2. The wells having been emptied, the concrete will be filled in and thoroughly consolidated in layers of 1 foot at a time. (The stream must of course be diverted for this, so that the construction of the dam must be undertaken when the river is at its lowest, and portions of it done at a time, so as to leave room for the stream, the last to be constructed being the side banks.) On the up stream side three wells of the same description and in the position shown in drawing, will be sunk to form a curtain for the concrete floor between the piers ; on the down stream side and spaces between the wells, the floor will be protected by means of 6 inch piling driven to the whole depth of wells

The wells and piling having been completed, the space between will be cleared out to a depth of 1½ feet and concrete, of the same description as for the wells, will be thoroughly consolidated in layers of not more than 6 inches.

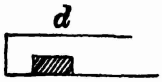
The masonry of the piers will be of the same materials as the wells and built in the manner shown in the drawing. At the points of cut-water stone should be used, if obtainable, otherwise the hardest bricks must be chosen for it instead.

The hinges for the gates will consist of 3″ × 1″ flat iron, built into the masonry of the piers at the point shown in the drawing, passing right through and bent thus *(a)* on the other side for securing to the masonry. They will rest on pieces of timber 6″ × 3″ built into the wall along their length. The inner ends will be converted into an eye for receiving the hook attached to the gate thus *(b)*. This hook will be attached to straps 3″ × 1″ passing round the vertical and along horizontal framing, and will be seen thus in plan *(c)*. The gate itself will consist of timber framing 9″ × 9″ secured at the joinings by iron straps 3″ × 1″ in the manner shown in drawing and having 3 inch planking nailed on diagonally on the outer side. Each gate will have a small opening fitted with a slide consisting of 3 inch planking secured to two iron straps 3″ × ½″ and drawn up and down by one inch iron bars, fixed to their tops and passing through the framing, with a cross handle at top. The grooves 3″ × 3″ for these slides will be made in two vertical pieces 9″ × 9″ secured to the lower parts of the two outer vertical pieces of gate framing, and a cut of 3 inches will be made in the horizontal piece immediately above for admitting the slide. The two end pieces of the gates will project 6 inches above, so that when the gates meet, an iron ring passing round will secure them. The ring to be of the same iron, *viz.*, 3″ × 1″.





For the timber piers 9″ × 9″ piles 15 feet in length will be driven into the ground in the position shown in drawing. They will be cut off square at level of bed of river and formed into a tenon 6″ × 6″ and 6″ deep fitting into mortises in the sill pieces 12″ × 12″ extending along the length. At each set of piles, there will be cross pieces 1½′ × 1′ and 5′ in length let into the other pieces half and half thus *(d)*, and secured to each other with two ¾″ iron bolts as shown in drawing. For the front portion, two sill pieces 12″ × 12″ will be used, bolted to the 1st cross piece and to each other on either side of piles with ¾″ bolts as shown in drawing.

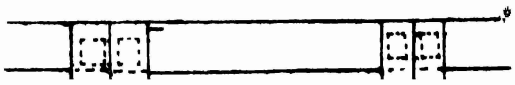


For the superstructure, posts 12″ × 12″ having tenons of 6″ × 6″ and of the same depth, will be let into sill pieces over 1st set of piles, to these will be bolted on the up stream side pieces of this shape *(e)* forming a point and acting as cut-waters; there will be 3 bolts of ¾″ iron to each, and they will also be bolted to each other with 3 bolts of the same description. The 12″ × 12″ posts will be secured to each other with 3-1″ bolts and will have grooves 3″ × 3″ for the planks to shut off water as shown in drawing. The posts over the rest of the piles will be 9″ × 9″, let into the sill pieces and secured horizontally and diagonally with timbers of the same scantling and iron straps and bolts, the former of 2″ × ½″ the latter of ¾″ square. The bottom and sides will have 3″ planking secured with spikes passing through, and turned down on the other side, and the space between will be filled with concrete of the same description as far described rammed in layers of 6″, and reaching to the top of frame work.

From the last set of piles there will be two struts of 9″ × 9″ let into the sill pieces at one end, and the 9″ post at the other, and further secured with long spikes.

The piers at the ends need not be so strong as the others, as the height of water here will be only 9 feet at the most, and half of it will be let into the embankment as shown in drawing. So that only the front portion of the other piers with struts at the back will be sufficient. The scantlings of timber and manner of construction will be the same as the others. The side banks will be 8 feet broad at top with slopes of about one in two, and will be protected with fascines bound of twigs tied together and fixed down on the slopes by pegs about 8 feet long driven into the earth, to which will be fixed bullies laid across the fascines. At the foot of slopes the fascines will be let into the ground for a depth of about 1½ feet. At the faces the embankments will be protected by piles 9″ × 9″ driven into the ground, having 3″ planking nailed on at the back (see drawing *(f)*.) The pieces laid over the fascines will be also secured to this face work to prevent its being thrust out by the pressure of the bank.

The first set of piles of each pier will be connected with those of the next by sill pieces 1½′ × 1′ and 12 feet long, thus :—



Estimate for Regulating Dam (Oudh Forests.)

Detail of work.	No.	Measurements. L.	B.	H.	Quantities.	
CENTRAL PORTION WITH GATE.						
WELL SINKING.						
Wells under piers, ...	8	...	...	12	96	
Curtain wells, ...	3	...	...	12	36	
Total of well sinking, ...	...	...	...	...	...	132
PUCKA MASONRY.						
In wells, ...	11	12½	1	11	1512	
PIERS.—Masonry in front portion, ...	2	11	2	14	616	
Do. „ centre, ...	2	5	2½	14	350	
„ back, ...	2	6	1½	7	126	
Total of pucka masonry, ...	...	...	...	...	...	2604
CONCRETE.						
		area.				
Concrete in wells, ...	11	7	...	12	924	
Concrete in floor, ...	1	22	17	1½	561	
Concrete in timber piers, ...	4	5	1½	93	270	
Ditto ditto, ...	4	4	1½	9	216	
Ditto ditto, ...	6	2½	2	15	150	
Total of concrete, ...	...	...	...	..	...	2121
TIMBER WORK.						
Gate framing, ...	8	10	9″	9″	45	
Ditto, ...	4	14	9″	9″	31·5	
Ditto, ...	2	14½	9″	9″	16·3	
Slides. For opening,...	4	5	9″	9″	11·2	
Planking, ...	2	10	3″	14′	70	
Plates under hinges, ...	8	2	6″	3″	2	
Total timber work of gate, ...	...	...	...	...	...	176
TIMBER IN LARGE PIERS.						
Piles, ...	10	15′	9″	9″	84·4	
Sill pieces, ...	3	5′	1½	1′	22·5	
Do., ...	2	15½	1	1	31·0	
Do., ...	2	4½	1	1	9·0	
Do., ...	1	5	1	1	5·0	
Posts, ...	2	13¾	1′	1	27·5	
Cut waters, ...	2	13¾	1	1	27·5	
Posts, ...	2	13¾	9″	9″	31·0	
Carried over, ...	...	...	...	...	237·9	

Detail of work.	No.	Measurements. L.	B.	H.	Quantities.		
TIMBER FOR ONE PIER.							
Brought forward, ...	...	...	...	...	237·9		
Posts, ...	2	10	9″	9″	11·2		
Do.	2	6	9″	9″	6·7		
Struts, ...	2	7	9″	9″	8·0		
Capping of posts, ...	2	9½	9″	9″	10·7		
Ditto, ...	2	3½	9″	9″	4·0		
Diagonal bracing, ...	2	10	6″	6″	5·0		
Ditto, ...	2	6	6″	6″	3·0		
Cross beams, ...	2	10	9″	9″	11·2		
Planking, ...	2	13¼	2¾	3″	18·2		
Do., ...	2	5½	9	3″	24·7		
Do., ...	2	4½	5	3″	11·2		
Do., ...	1	4	3½	3″	3·5		
Do., ...	1	4	3½	3″	3·5		
Do., ...	1	6	3½	3″	5·2		
Planking for shutting off, ...	1	8½	13¼	3″	28·1		
Planking below concrete, ...	1	4	3½	3″	3·5		
Ditto, ...	1	4	3	3″	3·0		
Sill pieces from pier to pier, ...	1	12	1½	1	18·0		
Total of timber in one large pier, ...	...	...	...	...	...	416·6	
Timber in four piers, ...	...	...	...	...	...	...	1,666·4
TIMBER IN END PIERS.							
Piles, ...	6	15	9″	9″	50·6		
Sill pieces, ...	2	9	1′	1′	18·0		
Ditto, ...	1	3	1	1′	3·0		
Posts, ...	3	13¾	1	1	41·2		
Do., ...	2	13¾	9″	9″	15·4		
Struts, ...	2	12	9″	9″	13·5		
Planking, ...	2	3½	3″	13¼	23·2		
Ditto, ...	1	2½	3″	13¼	8·3		
Planks for shutting off,...	1	8½	13¼	3″	28·1		
Cross beams, ...	2	10	9″	9″	11·2		
Sill pieces from pier to pier, ...	1	12	1½	1	18·0		
Total of timber in one abutment pier,...	...	...	...	...	...	230·5	
Timber in two abutment piers, ...	...	...	...	...	...	...	461
TIMBER IN BANK PROTECTION.							
Piles, ...	3	17	9″	9″	28·7		
Do, ...	2	15	9″	9″	16·8		
Do., ...	2	12	9″	9″	13·5		
Planking, ...	1	7	10	3″	17·5		
Do., ...	1	4	8	3″	8·0		
Do., ...	1	4	5	3″	15·0		
Do., ...	1	4	10	3″	0·0		
Do., ...	1	4	7	3″	7·0		
Do., ...	1	5	4	3″	5·0		
Timber for one bank, ...	...	...	...	...	...	111·5	
Total of timber for two, ...	...	...	...	...	...	...	223
Grand total of timber work, ...	...	...	...	...	...	...	2526
FASCINES FOR BANK PROTECTION.							
Sides of bank, ...	4	18	½	...	540		
Total S. F. Fascines, ...	...	...	...	...	...	540	
EARTHWORK.							
Formation of banks at ends, ...	2	17	18	5	3,060		
Total earthwork, ...	...	...	...	...	...	3,060	
Neemchuks, ...	...	...	...	...	11	11	

Abstract of expense.

			Rs.	Rs.
132	R. F.	Well sinking at per foot running, ...	3	396
2604	C. F.	Pucka masonry at per 100 c. ft., ...	30	781
2121	C. F.	Concrete at per ditto, ...	20	424
2526	C. F.	Timber work at per c. ft. including labour, carriage, iron, &c., ...	1	2,526
540	S. F.	Fascines including fixing, &c., ...	5	27
3060	C. F.	Earthwork at per 1000 c. ft., ...	2-8	8
11		Neemchuks at per each, ...	10	110
		For formation of temporary banks for execution of work, in keeping out water, say, ...	...	400
		Total of above, ...	...	4672
		Add contingencies at 5 per cent.	...	234
		Grand Total of cost, ...	...	4906

APPENDIX No. VIII.

Sales of Forest produce by contract for Forest Year 1870-71.

Sections.	Kheree Division.					Baraich Division.					Gondah Division.					Grand Total.
	II.	V.	VI.	VII.	Total.	II.	V.	VI.	VII.	Total.	II.	V.	VI.	VII.	Total.	
	Rs. As. P.	Rs. As. P.	Rs. As. P.	R. A. P.	Rs. As. P.	R. A. P.	Rs. As. P.	Rs. As. P.	Rs. As P.	Rs. As. P.	Rs. As. P.	Rs. As. P.	Rs. As P.	R. A. P.	Rs. As. P.	Rs. As. P.
Section 1, ...	...	1,300 0 0	55 0 0	...	1,355 0 0	...	...	250 0 0	1,300 0 0	1,550 0 0	1,000 0 0	*514 4 0	200 0 0 *360 12 0	...	2,075 0 0	4,980 0 0
Do. 2, ...	700 0 0	700 0 0	50 0 0	...	1,450 0 0	...	...	250 0 0	...	250 0 0	1,000 0 0	*514 4 0	200 0 0 *360 12 0	...	2,075 0 0	3,775 0 0
Do. 3, ...	...	1,000 0 0	50 0 0	...	1,050 0 0	...	...	...	..	...	1,000 0 0	*514 4 0	200 0 0 *360 12 0	...	2,075 0 0	3,125 0 0
Do. 4, ...	200 0 0	2,400 0 0	100 0 0	..	2,700 0 0	...	1,000 0 0	100 0 0	...	1,100 0 0	1,000 0 0	*514 4 0	200 0 0 *360 12 0	...	2,075 0 0	5,875 0 0
Do. 5, ...	...	400 0 0	125 0 0	...	525 0 0	...	...	...	...	...	...	...	...	...	...	525 0 0
Do. 6, ...	...	500 0 0	...	...	500 00	...	...	...	...	...	...	...	...	..	...	500 0 0
Do. 7, ...	...	950 0 0	125 0 0	...	1,075 0	...	...	...	...	...	...	...	...	..	...	1,075 0 0
Do. 8, ...	...	1,300 0 0	125 0 0	...	1,425 0 0	...	† ...	...	...	...	...	...	...	...	...	1,425 0 0
Fuel reserves, ...	...	...	...	...	...	...	...	...	...	...	100 0 0	200 0 0	150 8 0	...	...	450 8 0
Total, ...	900 0 0	8,550 0 0	630 0 0	...	10,080 0 0	...	1,000 0 0	600 0 0	1,300 0 0	2,900 0 0	4,100 0 0	2,257 0 0	2,393 8 0	...	8,750 8 0	21,730 8 0

	II.	V.	VI.	VII.	Total.
Kheree Division, ...	900 0 0	8,550 0 0	630 0 0	...	10,080 0 0
Baraich do., ...	...	1,000 0 0	600 0 0	1,300 0 0	2,900 0 0
Gondah do., ...	4,100 0 0	2,257 0 0	2,393 8 0	...	8,750 0 0
Grand Total, ...	5,000 0 0	11,807 0 0	3,623 8 0	1,300 0 0	21,730 0 0

* These figures refer to the lease of the Toolseepoor forest to the Mahárájah of Bulrampoor, which for convenience sake has been credited to 4 Sections of the Toolseepoor forest in Gondah though,

† One Section of the Toolseepoor forest is Section 8 of the Baraich Division.

W. STENHOUSE, CAPTAIN,
Offg. Conservator of Forests, Oudh.

APPENDIX No. IX.

LIST OF TREES, SHRUBS, AND PLANTS, IN THE OUDH FORESTS, COMMON TO THE BARAICH DIVISION DRAWN UP BY CHARLES JOHN PONSONBY, ESQUIRE, ASSISTANT CONSERVATOR OF FORESTS IN OUDH.

Number.	Botanical name.	English name.	Local name.	Authority	Reserved or unreserved	Remarks.
1	Abrus precatorius ...	...	Goonchee,	Linn ..	Unreserved.	A creeper, yielding a pretty little red and black seed used by goldsmiths for weighing gold and for necklaces.
2	Acacia arsia ...	..	Ailee, ..	W. & A.	Ditto ...	A straggling thorny climber.
3	„ catechu ...	Catechu tree ..	Khair, ...	Willd .	Reserved	Yields the "resin" known as "cutch." The timber is used in other provinces for house posts, and is considered very durable.
4	„ elata ...	White barked siris.	Sirsa suffaid, ...	Grahm	Unreserved.	A quick growing acacia with a handsome dark heartwood timber, used for rice, mortars and bowls in other provinces.
5	„ farnesiana ...	Sweet scented babool	Babool Wylatee,	Willd ...	Ditto ...	A shrub.
6	„ rugata ...	Soap bean ? or tamarind thorn ?	Aihla, ...	Lamarak	Ditto ...	A thorny creeper makes a good hedge if trimmed. The beans are used as soap, and make a good lather.
7	„ speciosa ...	Siris, ...	Sirsa ...	Willd ...	Ditto ...	Much resembles acacia elata, but not quite so large. Timber useful.
8	„ sundra ...	...	...	De'Con.	Ditto ...	Yields a very hard durable red wood. It is a small thorny tree, found on the hills, 8th Section.
9	Anathrum muricatum ...	Cus cus ...	Cush Cush ...	Beauv ...	Ditto ...	It is not generally known that this is the common grass used in thatching.
10	Amphidonax bengalensis ...	Reed ...	Nurcool ...	W. & A.	Ditto ...	To be found in nearly all swamps or borders of lakes, &c used for making mats, baskets, and for thatching. Several hundred people obtain their living by this mat making.
11	Amphidonax tenella ...	Reed ...	Chota Nurcool,	Arnoth	Ditto ...	Good buffaloe fodder when young.
12	Andropogon involutus ...	Bhâbur grass ...	Buncus ..	Stend ...	Ditto ...	A very valuable grass of which ropes are made; will yield some Rs. 5,000 of revenue Should be sold departmentally. Two annas a head load is the present price levied by the Máhárájah of Bulrampore. It is common in the 8th Section only.
13	„ iwarancusa ...	Lemon grass ..	Kushboo gass	Rox ...	Ditto ...	From which a very sweet scent is extracted, valuable.
14	Asparagopsis floribunda ...	Wild asparagas	Suntower .	Kunth ...	Ditto ...	Roots used in medicine, sold at a pice for a pice's weight.
15	Azadirachta indica ...	Neem ..	Neem ..	Ad: de: Juss,	Ditto ...	This is to be found in the Oudh Forests, but it cannot be a wild tree.
16	Ægle marmelos ...	Bale ...	Bale ghoomnah	Corr ...	Unre. should be reserved.	It yields a very hard durable and useful timber, color yellow Fruit possesses valuable anti-dysenteric properties.
17	Bambusa stricta ...	Bamboo ...	Bans or Bamboo	Rox ..	Ditto ...	It could probably be easily cultivated in the 8th Section, and would pay well, found in the 3rd Section.
18	Bassia latifolia ..	Mowah ...	Mowah ...	Rox ...	Ditto ...	From this wine is made, and natives also dry and eat it.
19	Bauhinia purpurea .	...	Mahowl ...	Linn ...	Unreserved.	Differs from bauhinia variegata. No. 21, leaf not so much split, and bark and leaf darker.
20	„ vahlü ..	Creeper S. P...	Morain, ...	W. & A.	Ditto ...	One of the creepers which are very destructive to the growth of trees.
21	„ variegata ...	...	Kutchnar ...	Linn ..	Ditto ...	
22	Bergera Kœnigii .	.....	Neem kuttia .	Linn ...	Ditto ..	A small tree with white hard wood.
23	Bignonia Suaveoleus ...	Padul ..	Padur ...	Rox ..	Ditto ...	A timber tree, wood moderately durable, used for house building.
24	Buchanani latifolia ...	Chironjee ...	Chironjee and pagnar.	Rox ..	Ditto ...	A small tree used for poles, &c.
25	Buddeelia neemdah ...	.....	.....	Ham ...	Ditto ...	
26	Butia froudosa ...	Dhák ...	Dhák ...	Rox ..	Ditto ...	Is remarkable in early March for its lovely scarlet flowers which hang in clusters, "lac" is grown on this tree.
27	Brachypterum scandeus ...	Sissoo creeper	Bhownr ...	Benth ...	Ditto ...	Seeds like the Dalbergia Sissoo.

APPENDIX No. IX.—(*Continued.*

Number.	Botanical name.	English name.	Local name.	Authority.	Reserved or unreserved.	Remarks.
28	Calamus rotang ...	Cane ...	Baint ...	Linn ...	Reserved,	Well known, grows abundantly in the south part of the 3rd Section.
29	Calosanthes indica ...	.....	Ussursona ...	Blume ...	Unreserved.	In March leafless, but has a large pod full of winged beans. Pod about 10 or 12 inches in length.
30	Calatropis gigantea ...	Maddar ...	Muddar ...	R. Brown	Ditto ...	A common plant found in the plains.
31	Cannabis sativa ...	Hemp ...	Bang ...	Linn ...	Ditto ...	This is found in the Oudh Forests, wild. It has an inebriating effect when crushed and drunk with water.
32	Capparis horrida ...	Caper ...	Caruloon ...	Linn ...	Ditto ...	A species of thorny creeper, very common in scrub jungle near villages.
33	Careya arborea ...	.....	Koombee ...	Rox ...	Ditto ...	Used for fuses in native guns.
34	Carrissa carandas ...	Kurrondah ...	Karowndah, ...	Linn ...	Ditto ...	A thorny bush, yields black milky berries, much eaten by natives.
35	Cascaria tomentosa ...	Chilla ...	Bayree chilla ...	Rox ...	Ditto ...	Natives pound the berries, and throw them into pools to kill fish.
36	Cassia fistula ...	Amutas ...	Amultasoorga Bunder tatlie,	Linn ...	Ditto ...	Has handsome yellow flowers in clusters. flowers in June, bears long cylindrical pods, The seeds are used as a purgative.
37	Cæsalpinia sepiaria ...	Mysorethorn ...	Aihlee ...	Rox ...	Ditto ...	A thorny creeper, common.
38	Cedrela toona ...	Toon ...	Toon ...	Rox ...	Reserved,	Well known as a furniture wood.
39	Conocarpus latifolia ...	Dhao ...	Dhao ...	Rox ...	Ditto ...	A white wood, sapple and strong, used for buggy shafts, cart axles, &c.
40	Cordia myxa ...	Lussora ...	Lussora ...	Linn ...	Unreserved.	Useless.
41	" vestita ...	.....	.....	Hf. and T.	Ditto ...	Found in 8th section on the hills. Has straggling branches, white smooth bark, dark green leaves.
42	Covellia glomerata ...	Golun tree ...	Goolur ...	Usig ...	Ditto ...	Elephant fodder.
43	Croton tiglium ...	Croton oil-plant	Jumalgota ...	Linn ...	Ditto ...	From which croton oil is extracted, natives use it as a strong purgative.
44	Cyperus perlenius ...	An Indian grass	Nagurmotha ...	Rox ...	Ditto ...	Used for mat making.
45	Dalbergia latifolia ...	Blackwood ...	Sheeshum ...	Rox ...	N. B.—Recommend to be reserved.	The famous "blackwood" of southern India, used there for furniture, very dark wood and strong.
46	" sissoo ...	Sissooshoshum	Sheeshum ...	Rox ...	Reserved,	A wood well known, handsome, useful and hard.
47	Dillina pentagyna ...	...	Agayee ...	Rox ...	Unreserved.	Hindoos use the leaves as plates at marriage feasts.
48	Diospyros tomentosa ...	Ebony ...	Abnoos ...	Poir ...	Reserved,	Natives eat the fruit, wood well known.
49	Ehretia lævis ...	...	Chamrood ...	Rox ...	Unreserved.	Common.
50	Elæodendron Roxburghii ...	...	Chownrye ...	W. & A,	Ditto ..	Red, fine grained timber, durable.
51	Epicarpurus orientalis ...	...	Sehorah ..	Blume ...	Ditto ..	Common.
52	Eurostigma Bengalensis ...	Banyan ...	Burgud ..	Gaspar	Ditto ...	Used as Elephant fodder.
53	" cardifolum ...	...	Kharbor ...	Miq. ...	Ditto ...	Elephant fodder.
54	" infectorum ...	Pakur ...	Pakeria ...	Miq. ..	Ditto ...	Elephant fodder, fruit white when ripe.
55	" religiosum ...	...	Peepul ...	Gaspar...	Ditto ...	Well known. Elephant fodder.
56	Feronia elephantum ...	Wood apple ...	Kait ...	Corr ..	Ditto ...	To be found, but not wild here.
57	Ficus caricoides ...	Wild fig ...	Ungur ...	Rox ..	Ditto ...	Natives clean their teeth with this when they have tooth ache.
58	" cunia ...	...	Coorhoor ...	Buch ...	Ditto ...	Bears fruit on its roots, used as medicine.
59	Fleminga s. p. ...	...	...	...	Ditto ...	Plentiful in the Binga Forest, used in thatching.
60	Guilandina bonduc ...	...	Kunj kunja	Linn ...	Ditto ...	Planted in the Nawabee time round forts for protection against invasion, almost impenetrable.
61	Glycosmis pentaphylla ..	.	Jairur ...	De Cand	Ditto .	
62	Grislea tomentosa .	..	Doyhotee ...	Rox ...	Ditto .	A pretty red flowering shrub, very common; flowers in March.
63	Holarrhena antidysenteria ...	.	Dhoodee ...	Wall ...	Ditto ...	Extensively used for making articles in ornamental turnery, also for fire wood.
64	Holopetala integrifolia ...	Elm ...	Dhumnah ...	Planch	Ditto ...	Used for building purposes.
65	Lagerstrœmia parviflora ...	Assid ...	Assid or cidda,	Rox ...	Should be reserved.	A hard durable wood used for house building.

APPENDIX No. IX.—(*Continued.*)

Number.	Botanical name.	English name.	Local name.	Authority.	Reserved or unreserved	Remarks.
66	Mangifera indica .	Mango ...	Am .	Linn ...	Unreserved.	Has become wild, as in the North-Western Provinces.
67	Miliusa velutina		Karie ..	Rox ...	Ditto ...	Used extensively in turnery, for making charpoy legs, &c., also in building small houses, very hard indeed and durable.
68	Moringa pterygosperma	Horse radish tree	Soonjnah ...	Gœrt ..	Ditto ...	The root is a capital substitute for horse radish, grows near villages, not wild in Oudh, a small tree.
69	Nauclea cardifolia ...	Huldoo .	Tickovie' ...	Rox ...	Reserved	Used for furniture and making combs, handsome light yellow wood, greatly cut for cattle fodder.
70	„ parvifolia	Kaim	Kaim ..	Rox ...	To be reserved.	Differs from above in leaf, being smaller, &c., wood same as above, &c.
71	Nelumbium speciosum .	Waternut	Purrain ...	Wild ...	Unreserved.	Grows in nearly all the swamps and lakes. It produces a most delicious nut resembling in shape the rose of a watering pot; fruit called by the natives Kewnul Gutta.
72	Odina woodier ...		Jigna ...	Rox ...	Reserved	Wood used in house building, moderately durable.
73	Orthanthera viminea ...		Mahoor ...	Wight	Unreserved.	Grows in beds of rivers and resembles "broom" in England.
74	Ougeinia Dalbergioides ...	Sandun ...	Panun ...	Rox ...	To be reserved.	A valuable durable wood.
75	Phyllanthus emblica ..	Oulah ...	Ownra ...	Linn ...	Unreserved.	The fruit is rough and bitter, a pickle and jam are made from this by natives.
76	Pinus longifolia ...	Longleafed pine	Dhoop ...	Rox ...	Should be reserved.	A timber tree from which resin is extracted.
77	Pongamia glabra ...	.....	Papur ...	Vent ...	Unreserved.	
78	Putranjiva Roxburghii ...	.....	Putjeet ...	Wallich	Ditto ...	A timber tree.
79	Rondia longispina ...	.....	Ghoorghea ...	D. C. ...	Ditto ...	Hard fine grained wood; liable to crack while seasoning.
80	„ dumetorum ...	.....	Mynee or mainful	Lam ...	Ditto ...	A large thorn; natives have a superstitious dread of it.
81	Rottlera tinctoria ..	Kumila ...	Rohnee ...	Rox ...	Ditto ...	This is very plentiful in the Oudh Forest, a valuable dye is made from it called Kumila.
82	Saccharum munja ...	Common reed	Sainta monj ...	Rox ...	Ditto ...	Found on low ground, useful.
83	Salmalia malabarica ..	Cotton tree ...	Semul ...	Drury ...	Ditto ...	Wood light, sometimes used for boat building; durable under water, sometimes used for well curbs.
84	Schleichera Irijuga ...	.....	Koosum ...	Willd ...	Should be reserved.	This grows to a great size in the 8th Section, and is worth some Rs. 20 and 30 per tree, should be reserved at once, wood used for oil crushers.
85	Semecarpus ...	Marking nut ...	Bhayla ..	Linn ...	Unreserved	This is well known for its poisonous qualities.
86	Shorea robusta ...	Sál, ...	Sakoo ...	Rox ...	Reserved,	Well known.
87	Spondias mangifera ...	Hogplum ...	Umra ...	Pers ...	Unreserved.	Common, not used for anything here that I know of.
88	Sponia wightu ..	Polishing plant	.....	Planch	Ditto ...	Has a dark green rough leaf.
89	Sterculia villosa ...	.....		Rox ...	Ditto ...	Like Jigna fruit capsule, red inside.
90	Syzygium calyophyllum ...	.	Mhadunwah ...	..	Ditto ..	A timber tree.
91	„ jambolaum ...	Jamun ..	Jamnee ..	D. C. ...	Should be reserved.	Well known; very durable under water.
92	Tamarix dioica ...	... .	Jhaoo	Rox ...	Unreserved.	Grows on dry beds of rivers used for making fishing baskets.
93	Terminalia tomentosa ..	Asena .	Ausna .	W. & A.	Reserved,	A dark heavy but rather brittle wood, sufficiently strong for temporary buildings and useful where weight is no draw back; well known.
94	„ bellerica	....	Bahayrah .	Rox ...	Unreserved.	A timber tree. Bark covered with an ash coloured bloom. Fruit eaten by natives.
95	„ chebula ..	....	Hurrah	Ret ...	Ditto ...	Common, fruit eaten by natives.
96	Trewia nudiflora ...	.....	Bhilowrah ...	Linn ...	Ditto .	Has a smooth greenish bark.
97	Zizyphus oenopla ...	.....	Mookeyea ..	Mill ...	Ditto ...	Bears a tart fruit eaten by the poor.
98	„ jujuba ...	.....	Cutt Bair ...	Lam ...	Ditto .	Cultivated kind found in the Oudh Forests near old sites of villages, not wild.
99	Zizyphus nummularia ..	.....	Jher bair ...	W. & A.	Ditto ...	Wild bairund.
100	„ xylopyra .	.....	Chitaina ...	Willd ...	Ditto .	Very much cut for cattle fodder.

J. PONSONBY,
Asst. Conservator, Oudh Forest,
Baraich Division.

APPEDNIX Q.

No. $\frac{1796}{141}$

FROM

THE SECRETARY TO THE CHIEF COMMISSIONER,

Central Provinces,

To

CAPTAIN DOVETON, CONSERVATOR OF FORESTS,

Central Provinces.

Dated Nagpúr, the 21st August 1871.

SIR,

I am directed by the Officiating Chief Commissioner to communicate to you his remarks on the Forest Report for the year 1870-71, submitted by your predecessor.

2. In the first place, Colonel Keatinge does not consider the form of the report satisfactory. He is aware that the report has been submitted in the same form for the last two years, but a change appears to him very desirable. In 1868 the Inspector General of Forests suggested that Forest Reports should consist of three parts—

1st.—An introduction containing statistical data, and an account of what had been done in the way of Forest legislation.

2nd.—A special part, divided into the following heads and sub-heads :—

I.—State forests and leased forests.

1. Area, boundaries, descriptive account.
2. Requirements of the surrounding population, prescriptive rights.
3. Protection.
4. Management and improvement.
5. Yield and working of the forests.

II.—Unreserved or district forests.

III.—Village or private forests.

3rd.—General part.

I.—Financial results.

II.—General remarks.

3. The above arrangement of subjects has been followed, but the report, instead of treating of the Province as a whole under each heading, has treated of each Forest Division separately. This method appears to the Officiating Chief Commissioner most unfortunate; it quite destroys the interest of the paper as a whole, and renders any comparison of the working of the Department in the different Divisions extremely difficult. There can be no object in thus taking up every Division separately, it would be preferable even to treat every separate forest by itself; but the plan which the Officiating Chief Commissioner desires to see adopted in future, is to review the Province as a whole under each head of the report, and thus permit some opinion to be formed of the results that uniformity or diversity of treatment has produced in the various forests which are under the management of the Forest Department.

NORTHERN DIVISION.

4. Concerning the management of the Northern Division but little information has been given. The departure of Mr. Strettell is to be regretted, but although Mr. Morrow, who succeeded him, was wanting in local experience, there was no reason why he should have abstained from going into Camp and becoming acquainted with his Division, merely because a number of Civil suits had been filed against the Forest Department in connection with the sleeper operations of the preceding year. Mr. Morrow himself had no personal knowledge of these transactions, and could give no information concerning them. Some other Officer or an agent of some kind might have been entrusted with the care of defending the suits for the Department, and Mr. Morrow set free to perform his more important duties.

5. The Bijerâghogarh forests were the only forests visited by a superior officer during the year. Referring to your remarks on the relaxation of forest rules which was after the famine year 1869 permitted in two out of the three tracts into which the forest is divided, I am to say that it is not obvious why any such relaxation was necessary after rain had fallen, and the growth of grass in the country had resumed its ordinary conditions. It is well known also that after the dearth, and chiefly on the occasion of the first down-pour of rain, much cattle died, and in consequence of this less grazing ground than usual would be needed.

6. The throwing open of the reserve for a second year bears an appearance of carelessness, as if no further attempt had been made to ascertain whether the measures of relief which had been devised to meet an exceptional state of affairs were any longer necessary.

7. The Bijeraghogarh forest tracts are considered among the most important in the Northern Division, and great hopes were entertained of them when they were originally selected for demarcation; at the time a considerable amount of correspondence took place in regard to the extent, to which the neighbouring cultivated village tracts were dependent on these forest lands for fuel and grazing ground,

but itseemed to have been conceded that only three or four villages were wholly dependent on them, and would require some indulgence to be shown to them. The Officiating Chief Commissioner trusts you will lose no time in looking into this matter and placing the management of the forests on a satisfactory footing.

8. In para. 5 Mr. Jacob remarks that he has not been " made acquainted with the conditions of the other State forests in the Division," but he believes that " fire and cattle have been excluded from Jagmandal and Chuharighogarh." On this, the Officiating Chief Commissioner desires me to observe that, considering the trifling nature of the operations connected with felling timber, the general neglect to protect the forests from cattle and fire, which may be inferred from the report that has been given, is most painful, and indicates that the subordinate officers of the Forest Department have yet to learn the rudimentary principles of their profession. Colonel Keatinge considers it almost impossible that they should have failed to report on any part of their duties to which they had in reality devoted much of their attention during the year.

9. The Garhakota and Ahiri plantations are the only ones in the Northern Division. The progress made in them is referred to in paras. 10 and 11 of the report.

10. The former plantation is only 25 miles from Ságar, and is situated in a large tract of waste land in a favourable position ; but the Officiating Chief Commissioner regrets to have to express an opinion that the Garhakota reserve has hitherto been much mismanaged.

11. The Ahiri plantation is situated at a distance of 40 miles from Mandla and 97 from Jabalpur. It is too far from any market to be a valuable plantation, and too far removed from all convenient supervision to be a successful one. Colonel Keatinge does not wish to see the operations extended, but what has been planted must be preserved.

12. Under the head of yield and working of forests the only operations during the year appear to have been the collection at Garhakota and at local depots in the Maikal forest range of certain logs of wood and a certain number of sleepers felled and prepared during the preceding year.

13. Of the incomings of the Department, which amounted to Rs. 1,86,418, more than half consisted of sums which had remained due from the season of 1869-70.

Western Division,

14. As was the case with the Northern Division, the Western Division has not received the amount of personal inspection from the officer in charge of it that is desirable.

15. Mr. Webber, the Deputy Conservator, is said to have employed himself in " defining the duties and charges of his subordinates," and to have taken much interest in the demarcation of

reserves, recording their position on the maps of the Survey Department, and in settling the position of villages situated in the Government reserved forests.

16. It would have been useful to know the manner in which Mr Webber apportioned their duties to his subordinates, but no information on this point is given in the report, which is equally silent regarding the extent of the demarcations effected.

17. In regard to the final portion of para. 17, I am to remark that the Topographical Survey maps that Colonel Keatinge has seen do not show the Forest reserves, and it appears to him of the highest importance that Forest officers should delineate on them the reserved areas, not only for their own use in the management of their Divisions or charges, but also that the position and extent of these forest areas may be clear to the superior officers of the Administration.

18. One of Mr. Webber's boundary maps, on a topographical sheet of 1 inch to a mile is the first approximately correct map of the Bori forest that the Officiating Chief Commissioner has yet seen.

19. In para. 19 some comparison is instituted between the produce yielded by the State forests and that of the private and Government unreserved wastes.

20. The Officiating Chief Commissioner hopes that Mr. Jacob is right in considering the conditions of the Government State forests so superior, but Colonel Keatinge's own limited experience does not confirm this view. The only really protected forest which Colonel Keatinge has seen is the Bori forest; the others he has passed through being so overgrazed and burnt that no seedlings are coming on. But when contrasting the conditions of reserved forests and unreserved or private waste lands, it must be remembered that the Government reserved forests have hitherto scarcely contributed at all to the wants of the population, and it may then well be that they are for that reason alone better stored than the unreserved wastes, which have supplied all demands of the surrounding villages.

21. It is satisfactory to find that fires have been excluded from the Bori forest. The resulting advantages are unquestionable.

22. In para. 23 the settlement of villages in Government State Forests is referred to. Some further details might have been usefully given, but a satisfactory arrangement appears to have been come to, if it be allowed that cultivation within the limits of the forests can be permitted at all. The constitution of these village communities appears to be peculiar, and some plan more consonant to their feelings might perhaps have been devised than the plan of making one man, not possessed of any authority or influence, represent the whole community. When a short time shall have elapsed it will be possible to judge of the suitability of the arrangement that has been made.

23. The Bankabarda plantation is the only one referred to in the Division. Its position is moderately favourable, and the Officiating Chief Commissioner believes it has been more successful than most plantations under the department.

24. There was no felling of timber during the year.

25. The income of the Division derived from Government State forests is shown to have been Rs. 96,243, of which Rs. 27,774 were realized from the sale of minor forest produce and certain privileges. The balance then, Rs. 68,469, must represent the income derived from the sale of timber, and as the sales during the year amounted only to Rs. 6,523, and Rs. 2,092 of this sum remained uncollected at the close of the year, it is evident that the bulk of the year's income consisted only of debts due from the year preceding.

26. It is said in para. 28, with reference to the sum derived from the sale of minor forest produce, &c., that the amount had "never before been approached from these sources." The Officiating Chief Commissioner would have been glad to know to what the improvement in this respect was due, or whether it was only the consequence of a change of policy, by which certain State forests were placed on the same footing as the unreserved wastes. From remarks made in para. 23 it seems not unlikely that something of this kind was the case, and that the results on which congratulations are claimed are not solely due to good management, and have not been produced by good forestry alone.

Southern Division.

27. In the Southern Division, beyond recounting the trees in the Ahiri forest, a work which had not been completed at the close of the year, and the collection of timber already felled, no important work has been done.

28. The income from Government State forests is very trifling.

Eastern Division.

29. In the Eastern Division no operations of an important nature have been in progress.

30. Regarding the Korba forests the Officiating Chief Commissioner desires me to say that he can conceive no possible reason for taking over the forest. It is situated in a most inaccessible part of the Central Provinces, and a very high price would have to be paid for it, while it is evident from the reports received that the Zamindar knows the value of his timber and protects it.

31. The exclusion of fire and cattle from the Hathibari forest is a favourable feature in the report on the Division.

32. No details have been given regarding the position of the plantation referred to in para. 37, but it must be the Hathibari plan-

tation. The situation is far too remote for a plantation, and it should not be increased.

33. In para. 40 the loss by fire of a considerable quantity of timber stored at the Kantara Nala is mentioned. No report of the circumstance was made at the time, as ought to have been done. The Officiating Chief Commissioner would wish to know all details, and whether the timber was properly protected from ordinary jungle fires.

CENTRAL DIVISION.

34. In the Central Division the Satpura Reserve is the only reserve remaining under the management of the Department, and the demarcation of this reserve appears to have been the only work attempted during the year. The Officiating Chief Commissioner visited one of the most accessible spots in it near Kurai in the beginning of May, and found the boundary demarcated in a most expensive manner, but no difference of any sort was to be observed on crossing the line of boundary. Inside, the forest was burned, overgrazed, and lopped by herdsmen as much as outside. There was in the few miles Colonel Keatinge rode through not a single stick of timber fit for the roof a common native house of the better sort, and from the condition of the tract the production of a seedling was impossible. Colonel Keatinge returned from his ride with the impression that the demarcation was under such circumstances useless.

35. In September 1867 the Inspector General of Forests made certain proposals for the conservancy of this reserve. It was to be divided into two parts—the eastern and western,—the Great Northern road forming the boundary between them. In no part were cattle to be allowed to graze, and no timber of any kind was to be cut in the western portion; grass was only to be cut, and mhowa, chironji, lac, gum, wax, and dry wood collected. In the eastern portion, besides the trees reserved in the Forest Rules, the following were to be reserved :—

(1) Dhaman; (2) Jaman; (3) Tendu, (4) Bhiri ; (5) Khair ; (6) Mhowa

The tract was to be divided into four divisions, natural boundaries being as far as possible observed, and a limited area in each division was to be set apart for each year's cutting. A sketch map was to be prepared showing the various areas and indicating where teak was abundant.

36. The feasibility of carrying into effect these proposals was discussed with the Commissioners of the Nagpur and Jabalpur Divisions and the Deputy Commissioners of the districts bordering on the reserve.

37. To exclude cattle from the whole reserve would it was ascertained inflict great hardship on a large number of people, whose

wealth consists of herds of cattle, and as a compromise it was suggested in 1868 that those portions of the forest which contained young trees of the most promising appearance should be marked off and the admission of cattle strictly prohibited. The particular areas to be marked off were to be selected in the cold weather of 1868.

38. In 1869 the sanction of the Chief Commissioner was solicited and obtained to leasing out separately the right of grazing, collecting firewood, cutting grass, collecting mhowa and other forest produce in certain specified blocks. It was then stated that the Assistant Conservator in charge had not received instructions in sufficient time to enable him to make arrangements of a different nature from the temporary arrangement made in the preceding year when the circumstances connected with the reserve were under consideration.

In November 1869 a report was submitted showing what had been done to give effect to the Government orders for the preparation of maps and partitioning out of the forest.

At that time a Revenue Survey party had prepared a map of a portion of the eastern part of the reserve containing an area of about 150 square miles. Nineteen blocks had been marked out in this area, and the Assistant Conservator proceeded to clear the boundary by a broad line.

With the exception of two small portions the entire tract west of the Great Northern road was closed against the cutting of timber, but the entire tract was available to the public for pasturage. Additional maps in completion of a map of the whole forest area were then expected, and as the want of maps had been assigned as the cause of the delay in carrying out the principles on which the forest was to be worked, it was confidently anticipated that now at last the plan sketched out for managing the forest would be carried into execution.

The Forest report for 1869-70 showed that the eastern part of the reserve had been divided into 42 blocks, the limits of 20 of which had been marked off on the ground, and had been noted on a map prepared on the scale of 4 inches to the mile.

A sketch map accompanied the report showing how much of the boundary line had been surveyed, and how much remained to be surveyed, but no details of management were given.

This year again very little has been done in the Central Division, owing to the want of a sufficient number of officers.

No sketch map has accompanied the report, and the Officiating Chief Commissioner cannot judge whether as yet anything has really been done to place the management of this valuable forest area on a sound footing.

The impression which a cursory inspection of one part of the forest made on him has been already referred to.

39. In future, as was originally suggested by the Inspector General of Forests, a sketch map should accompany the annual progress report and show the various compartments of the forest and the areas assigned for cutting. It will be necessary to show also the areas from which cattle are entirely excluded, and in the case of every forest a short account should be given showing the amounts realized by the sale of minor forest produce, firewood, bamboos and building timber in the areas assigned for the purpose.

40. Para. 46 shows that Rs. 1,211 were expended for the exclusion of fires from this reserve, with, it is said, some success. Colonel Keatinge would like to know the details of this.

Unreserved Forests.

41. The management of the unreserved forests or Government waste lands has resulted in a considerable increase of revenue, chiefly in the districts of the Jabalpur Commissionership, which are included in the Northern Forest division.

42. Several systems of management are yet under trial. The system of commutation as it is called, that is of assessing so much on villages in consideration of the produce they are allowed to remove from the Government wastes or the cattle they send to graze there, is most in favour in the Chhattisgarh and Jabalpur Divisions.

In the former Division it would appear that the system has been too rigorously carried out, and the arrangements require to be amended.

43. In the Nagpur Division the wastes were in most districts either leased out or remained under direct management.

44. The requirements of the population have to be considered in determining what form of management is likely to be most successful financially, without exhausting or injuring these forest lands.

45. From the remarks made in para. 57 it would appear that the Deputy Commissioner of Balaghat has been trying artificial planting without the exclusion of cattle from the plantation. The experiment must, the Officiating Chief Commissioner feels convinced, result in a mere waste of time and money.

46. It is to be regretted that the Deputy Commissioners of Seoni and Bilaspur have not been more punctual in submitting their reports.

47. In Bilaspur the arrangements connected with the management of the Government wastes have not been so satisfactory as they ought to have been, and the revenue has not been punctually realized.

48. There is one point on which the Officiating Chief Commissioner would have liked to receive more ample information, and that is how far the population of the Central Provinces, whether rural or urban, are dependent for timber, firewood, and pasture land on each separate Government reserve, and how far their wants are met from Government or private waste lands. In no part of the present report is the subject dwelt upon with sufficient fulness, and yet it is one of the most important matters which Forest officers are required to consider.

49. The total income from these unreserved forests has been Rs. 3,71,852,—an increase by about 18 per cent on last year's revenue.

50. In Statement No. 21 the total revenue of the Department from all sources is shown. Of the Rs. 2,49,137 there shown as realized from sale of timber at depôts, only about Rs. 1,00,000 seem to be on account of timber sold during the year. The greater part represents collections of outstandings from the previous year. The income of the Department is thus swelled bythese items.

51. Mr. Jacob has premised his report by referring to the great number of changes that took place in the Forest staff during the year, and he deprecates the unfavourable impression which the small amount of information he is able to give on many matters connected with the Forest charges must necessarily make. He again alludes to these changes at the end of the report.

On this subject the Officiating Chief Commissioner desires me to say that he thinks the report generally shows that there is a want of system in the administration of the Forest Department. Had the subordinate officers been obliged by standing orders to submit periodical reports and full diaries of their proceedings, it would not have been possible that on the sudden departure of the Deputy Conservator of a Division, the Conservator could have been ignorant of the fact whether large tracts had or had not been protected from cattle or fire.

These facts would have been ascertainable from the papers on record. This want of system and consequent want of information is also apparent in the very long delay which has occurred in obtaining the information called for by the Officiating Chief Commissioner on the 14th June 1871 as to the degree of protection accorded to the different tracts of reserved forests. That this information is not procurable from every clerk in the department is a matter of astonishment.

52. As an agency for the sale of timber, the Forest Department has in this as in former years performed its duties well, but viewed as an agency for the formation of forests for the good of future generations and for the renewal of timber in tracts where the wood has been exhausted, Colonel Keatinge believes that the department has still

its work before it, and Colonel Keatinge's experience is that the subordinates in the department have yet to learn the rudiments of their profession in relation to these important matters.

65. The Officiating Chief Commissioner desires me to remark that if the Department is to succeed, its officers must not, as heretofore, accept the forest and the bare plain, as they now exist, as unalterable features of the country, but they must reason and ask themselves why these forests remain and why whole districts are devoid of verdure. They must not content themselves with watching the forests whose remoteness and inaccessibility have alone been their safeguard from the indiscriminate and wasteful felling and burning which has destroyed all the wood nearer to the centres of civilization; but they must set themselves to the task of providing firewood, timber, and bamboos for the large areas where the population has absolutely no such materials within a reasonable distance. It will be well, I am to add, for Forest Officers, before giving up their whole energies to the production and preservation of first class timber, to bear in mind that where permanent structures are concerned, iron now takes the place of timber for many of the purposes to which until lately the latter was exclusively applied; while the demand for second and third class wood, which alone is used by the mass of the people, is not likely for a long period yet to be affected by any such consideration.

I have the honor to be,

Sir,

Your most obedient Servant,

J. W. NEILL,

Offg. Secretary.

No. 263.

FROM

THE OFFG. CONSERVATOR OF FORESTS,

Central Provinces,

To

THE SECRETARY TO THE CHIEF COMMISSIONER,

Central Provinces.

Dated Nágpúr, the 3rd June 1871.

SIR,

In submitting the administration report of this department for the year 1870-71, I feel no alternative left me than to preface it by admitting that departmentally the year has been one of decidedly deficient progress, and has not been productive of such favourable results, on the actual operations of the year under review, as might reasonably be calculated upon to ensue from the more advanced state of organization to which the department should by now have attained. Should this report not bear comparison in the fulness of information and detail with those of past years, I trust the deficiency will not be attributed to haste or want of careful consideration on my part, but to the more correct circumstances of the want of active progress and the indifferent aid in supplying me with data, which the Staff, composed as it was at close of the year, was able to render me ; this last remark requires some qualication in order that I may not seem unreasonably to imputo the whole want of success to the Staff alone, and I would therefore wish to record that most of the members rendered me all the information that, considering their want of local knowledge and experience, and the opportunities at their command, enable them to do ; but when it is borne in mind that within the year the three officers of the senior grades all left from illness, or other causes, and that their places were only supplied by juniors of both limited local and departmental experience, I trust my claim to consideration will not be denied. I shall as much as possible adhere to the system adopted in the preparation of the reports of previous years and distribution of subjects.

NORTHERN DIVISION.

Introduction, Statistical data, &c.

2. As regards this part of the report on this Division, I am not in a position to contribute any information in addition to what has been heretofore recorded. Mr. Strettell, the Divisional officer at commencement of the open season only accomplished a short tour through Ságar, regarding the reservation of the waste lands of which district he made useful propositions, but which until they attain a more matured stage scarcely afford subject for comment here. On completion of this tour Mr. Strettell was obliged from illness to go to Europe, and the

conduct of the duties devolved on Mr. Morrow, an officer unfortunately devoid of all local experience in this part of India, and who, in addition to this, was so occupied with the management and defence of numerous Civil suits preferred against the department upon claims arising from mismanagement in connection with the sleeper operations of the previous year, as to prevent his being able to get into camp for almost the entire open season, consequently, he has been unable to furnish me with any information collected under his personal observation.

First Part, Special.—Head I.—Section I.

State Forests.—Bijeraghogarh.

3. Except as regards Bijeraghogarh, no information can be recorded as to the condition of the State forests from personal inspection by other officers than the subordinates charged with their protection. I myself made an examination of the three tracts of which the above-mentioned reserve consists. The protective arrangements in two of the tracts had been relaxed to such a degree in consequence of the sufferings of the neighbouring population from famine, and the consequent privations to which the cultivators and their cattle had been subjected, that I might almost say, that beyond the realization of a small income and the protection of Sál, for which timber the tracts were selected for reserve, all other restrictions had been withdrawn. In the third tract protection had been more enforced, and fire and cattle had been excluded up to the time of my inspection. In February 1871, instructions were issued to continue the operation with care, and to enforce more strict protection in the other tracts, but the Divisional Report does not allude to either subject.

4. I have no hesitation in advocating the continuance of the exclusion of cattle and fire from the tract which has been so treated, but the maintenance of a rigid system of conservation and strict enforcement of forest rules in the other two tracts seriously affects the condition of several prosperous villages in the vicinity, and must form subject hereafter for separate reference and discussion.

State Forests.
Jagmandal
Chooharighogarh
Barela.
Sangrampur.
Garhakota.

5. I have not been made acquainted with the condition of the other State forests in the Division, but I believe fire and cattle have been again excluded from Jagmandal and Chooharighogarh, but no remark is made on that or any other operation in the Division, and without regular detail to guide me I cannot possibly enlarge on the progress of the year.

Sal forests on the Maikal range.

6. The selection and demarcation of these forests has again been deferred in consequence of the non-employment of an officer with sufficient local knowledge to enable him to carry out the work satisfactorily, and as there has been a Survey party engaged in the locality this season, we may look shortly for the publication of maps, which will much facilitate the carrying out of the work.

Head I.—Section 2.

Requirements of the population.

7. It seems to me preferable to reserve the review of this section for a general expression when noticing the reports of District officers, as the general wants of the population are much more extensively supplied from the forests under their, than those under direct departmental, control, and I shall therefore allow this remark to apply to the section in all other Divisions.

Head I.—Section 3.

Protection.

Breach of Forest Rules.

8. There have been 62 breaches of Forest laws, involving 266 persons, of whom 155 were convicted and punished and 15 acquitted; the cases were chiefly brought forward by the district Forest officials, as offences against the Act are of rare occurrence in forests under departmental control.

Head I.—Section 4.

Management and improvement.

9. The operations under this section have been confined to a general system of protection as established originally, and the raising of teak artificially, but on a limited scale as compared with former years. I have already referred to my inability to represent in full detail the results of the former, and I am wholly dependent on the statements of the condition of the plantations at Ahírí and Garhakota up to close of the year, without the assistance of any report or explanation.

Garhakota plantation.

10. Para. 29 of my Report for 1869-70 exhibits the condition of the plantation up to close of that year, and the return now before me shows the area planted up to close of the year under report to be 15 acres, 2 roods, and 39 poles; that 4,496 seedlings were planted out during the year, making a total alive at close of the year of 11,478, at a total cost from the commencement of Rs. 5,971, thus giving the result of 729 plants per acre at a cost per plant of annas 8-4.

Ahiri plantation

11. The return shows that here the former area has been increased by 16 acres, 1 rood, and 9 poles; the number of seedlings transplanted during the year was 14,000, but there having been 5,678 deaths, the total number alive at close of the year is 49,509, at an outlay from the commencement of Rs. 16,268, or a crop of 678 plants per acre at a cost of annas 5-3 per plant. This is not much in excess of the average of the previous year, but must be still considerably reduced, which is practicable under careful management, before I can advocate material extension of the operation. I have not been supplied with, although it was prescribed in the general instructions which I prepared for the management of plantations, the return showing rates of growth, consequently as complete a record of the results is not furnished as I could wish.

Roads.

12. I was able last year to refer to the improvement of lines of communication, but cannot do so this year, owing to the almost complete abandonment of timber operations in this Division. This, I trust, is, however, temporary and solely consequent upon the unfavourable circumstances under which the Division has been conducted, and I look forward with confidence to being again able to carry on timber operations on a reduced though remunerative scale on re-assuming charge of the Division, which I expect to on the return of Captain Doveton on expiry of his leave.

Head I.—Section 5.

Yield and working of forests.

13. The transactions under this section consist merely of the collection at Garhakota of 61 pieces of teak and the collection in local depôts of 11,370 sál sleepers in the Maikál Range Forests, which were made in excess of the number required to complete our contract with the Great Indian Peninsula

Railway Company. The estimated value of this stock amounts to Rs. 60,077. The sales within the year consist of 4,271 pieces of teak and 14,877 sleepers, and the amount realized therefrom is Rs. 85,434, of which Rs. 7,909 were not recovered in sufficient time to be exhibited to credit of the year's income.

14. The previously estimated value of the above stock has not been realized, owing to the loss in rafting of 126 teak logs and 45 sleepers, and also the non-realization of the estimated value, by Rs. 11,571, of teak and other timber which was disposed of by auction. This latter timber had much deteriorated from storage during a series of years, and was chiefly the rejections from the stock accumulated at Jabalpur during those years. I examined it all carefully myself, and selected the pieces which I decided it was preferable to get rid of for whatever they would bring, as also the pieces which seemed to me in a condition to bear further storage.

Epitome of cash transactions.

15. The actual amount resulting from sales of timber, inclusive of outstandings from the year 1869-70, is Rs. 1,86,418; of which, however, only Rs. 1,76,350 has been recovered. In addition to the above, the realizations from various sources from State forests under departmental control amount to Rs. 4,942, or a total of Rs. 1,81,292, against Rs. 1,33,816 collected by the same agency in 1869-70. These results are even more favourable than might have been reasonably expected in the very unsettled state of this Division.

Heads II. and III.

Unreserved forests and village and private forests.

16. I follow the same course in dealing with this section as that taken last year, viz., attaching a contrasted Statement of this and the past year's income, reserving the review of the aggregate results for a general section.

Year.	Receipts.		Total.	Charges.	Savings.	
	Unreserved revenue.	Reserved revenue.			Surplus.	Deficit.
	Rs.	Rs.	Rs.	Rs.	Rs.	
1869-70	59,161	35,964	95,125	2,70,011	1,24,886	...
1870-71	95,857	1,82,292	2,77,149	1,26,008	1,51,141	...

WESTERN DIVISION.

Introduction, Statistical data, &c.

17. This Division has again, as noted last year, suffered from a change of officers, as Mr. Webber was obliged to have leave to Europe, and although he was able to conduct the duties up to close of the year, yet, for reasons into which it is unnecessary to enter here, he was unable to take up his field duties during the greater part of the open season with as much activity as would secure a really efficient administration of this extensive Division, with its large establishment. I must, however, do him the justice to say that he endeavoured to discharge his duties to the best advantage, in the face of difficulties; that he in a great measure defined the duties and charges of his subordinates with good effect, and took much interest in the demarcation of reserves and the arrangement of the villages which are so numerous in all the State forests of this Division and render their management a complicated and difficult undertaking with a Staff so

inadequate to the varied circumstances of the work generally. Mr. Webber has furnished me with a tracing taken from the Topographical and Revenue Survey Maps recently published, showing the areas under reserve, but in the hurry of his departure, he was unable to complete them with sufficient accuracy to admit of their being annexed for publication. There is further very little to be gained from such tracings, as the maps above noted provide all the information with perfect accuracy that can be requisite either for completion of the demarcation or the Revenue Administration of the tracts, to accomplish which only requires a sufficiently continued residence of an energetic divisional officer.

18. The reasons for taking up the reserved areas in this division with their condition, extent, and various other details, having been enlarged upon in previous years, I see no advantage in repeating them here, consequently I shall proceed to review the transactions of the year in accordance with the several sections, passing over Head I, Section 1, under which there has been no alteration from what is represented in the report for 1869-70, at paras. 76 and 77.

Head I.—Section 2.

Requirements of the population.

19. These are at present amply provided for from the extensive resources available; but the effects of the overstrain upon the forest lands conferred in proprietary right and the Government excess wastes are distinctly perceptible when the general crop now borne by them is contrasted with that of the State forests, where protection has been more strictly practised. This circumstance would point to the necessity of a more extended system of reserving forest lands, but I do not consider that immediate action is called for, or that the Forest staff, as at present organised, is equal even to the effective administration of the areas under direct control; and I am also of opinion that the selection of small and detached areas in accessible situations capable of a better directed and well defined management would prove more advantageous in every way than endeavouring to carry on the combined Forest and Revenue administration now prevailing in the unwieldy, and in several instances unproductive, areas under our control.

Head I.—Section 3.

Protection.

20. There is a difficulty in dealing in a general way with this section, or in representing any more well defined system of protection as existing other than that resulting from the presence of the preventive establishment entertained for each forest, and the next succeeding section admits of a fuller description of the principles of protection and administration combined.

Exclusion of fire.

21. The Bori forest is the only one subject to this operation, and fires and cattle have been again kept out for now the sixth year in succession. There can be no possible doubt as to the immense value and importance of the proceeding,—rapid regeneration, luxuriance of growth, increase of yield, and timber of sounder quality, convey in condensed form some of the benefit resulting from exclusion of fire and cattle, while I failed to observe any single disadvantage. In fact, so unquestionable have I now come to consider the results from personal observation, that from once being a strong advocate for enlarging artificial planting operations, I now consider the results of the operations, except under some circumstances specially in favour of planting, will bear no comparison in so far as the extension or regeneration of exhausted timber growth.

22. There have been 23 offences against the Act, in which 33 persons were implicated, of whom 10 were convicted and variously punished, and 23 acquitted.

Breach of Forest rules.

Head I.—Section 4.

Management and improvement of forests.

23. The transactions coming under this section have been chiefly confined to the introduction of the license system, instituted with such success by Captain Forsyth when Deputy Commissioner of Nimar; the delimitation of the lands to be occupied under annual lease around squatter villages as tenants-at-will; the more clearly defining of the boundaries of land conferred in proprietary right within reserve limits; and a survey of the areas in Betul known as the Kamapur reserve. The first has worked with equally good financial results to those obtained in Nimar, and is, I consider, thoroughly applicable to our reserves in this division; a large increase of income has occurred, and during my tour through the division the population seemed more content and complained less of interference with what they have come to consider their forest privileges than in almost any part of the country I visited this season. As regards the second measure, much has been accomplished, and a well established system of assessment has been introduced. There was some difficulty experienced in convincing the inhabitants of squatter villages that they only enjoyed tenure-at-will, and in inducing them to accept the form of annual lease now in use. The chief obstacles seemed to be to prevail upon either one man to incur the liability of the other villagers and to induce the whole of the villagers occasionally of different tribes to entrust their interests to one single representive. I, however, while in charge of the division, since Mr. Webber's departure, selected a certain number of villages, the depopulation of which would least affect forest interests in each reserve, and on finding that the time had come when they must either accept the terms offered or abandon their villages; the people in almost every instance elected for the former, and I feel confident it now only requires a little firmness and moderation to secure universal adoption of the annual lease, but caution should be exercised that population does not increase too much, and that none but situations should be occupied which will not interefere with forest interests.

24. I can scarcely state to what extent progress had been made in the demarcation of the lands conferred in proprietary right, as actual details have not been furnished, and owing to the conclusion of the financial year in the middle of the working season the progress of the Survey in Kanapúr could not be shown. I have, however, good grounds to hope that the maps will be complete and available for the open season of 1871-72.

25. Artificial plantation on anything of a scale worthy of review has been confined to Bankabarda the situation of which was described in last year's report. During the year under report the area has been extended by 51 acres; the total extent now under teak, as will be seen from the return annexed, is 75 acres, 2 roods, and 10 poles, containing on the 31st March, 50,129 plants, raised at a total outlay of Rs. 10,385; this gives an average of 666 trees per acre, at a cost of annas 3-4 per plant. It will be thus observed that the expense of the work has been considerably reduced, as compared with that of the year 1869-70. The details furnished are imperfect, and not in accordance with the instructions laid down, or the forms prescribed, consequently I cannot enter at greater length into this section.

Bankabarda plantation.

HEAD I.—SECTION 5.

Yield and working of forests.

26. Timber operations have been confined within the narrowest limits, and the receipts during the year consist merely of 869 logs, felled in former years, and now brought into depôt, and 498 logs, which we were obliged to re-exhibit on stock as returned by the Department Public Works, Mhow; these latter were not all removed from depôt but having been made over to the Engineer Department, and not applied to the purposes for which they were originally intended, after considerable discussion it was decided that we should receive them back again.

Epitome of cash transactions.

27. The realizations from sales only amount to Rs. 6,523, of which Rs. 2,092, remained unrecovered at close of the year, for timber delivered for the Pachmarhi barracks; and the value of the stock on hand at close of the year is reduced by loss to the extent of Rs. 13,586, and by deterioration, as proved by completion of the re-survey and classification alluded to as requisite in para. 97 of the report for 1869-70, to the amount of Rs. 28,685, or a total during the year of Rs. 42,271. This undoubtedly shows the timber transactions in an unfavourable aspect, but the demand for timber, as estimated in past years in this Division, never was realized, while the completion of the line of railway reduced it still more, and the timber was of such an indifferent class that prolonged storage must be productive of the loss shown above.

28. The income of the division for the year resulting from departmental control and inclusive of outstandings from 1869-70, is Rs. 96,243, of which Rs. 27,774 have been realized from sales of minor forest produce and privileges, an amount which never before was even approached from those sources, so that if returns from timber transactions have fallen below the standard of past years, we may claim credit for improvement in, during the present exhausted state of the forests, what I might call the more legitimate branch of general revenue administration and management.

29. The income from unreserved forests amounts to Rs. 81,885, or a total of Rs. 1,78,129, as against Rs. 92,710 in 1869-70. This increase will be enlarged upon in the general section hereafter on financial results, but for facility of reference I annex the Statement of receipts and charges, as hereafter, for 1869-70 and the year under report :—

YEAR.	RECEIPTS.		Total.	Charges.	SAVINGS.	
	Unreserved forests.	Reserved forests.			Surplus.	Deficit.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1869-70	77,644	15,066	92,710	88,470	4,240	...
1870-71	81,885	96,243	1,78,120	69,325	1,08,803	...

SOUTHERN DIVISION.

Introduction, Statistical data, &c.

30. The conditions of this division being unchanged from those represented in para. 119 of the report for 1869-70, I shall adopt the same course in reviewing the results which I did in the report for that year. It having been proved that the enumeration of the growing stock in one of the Ahírí tracts was not sufficiently

accurate to form the basis of a valuation it was decided to have the work done over again, but it had not made such progress by the close of the year as enables me to supply statistics of interest, while this report is not the channel in which to review the operation. And the decision as to the terms of occupancy or otherwise by Government of the forest alluded to being influenced by the valuation to be made, no works of impovement have been undertaken.

HEAD I —SECTION 5.

Yield and working of forests.

31. Operations under this section have been almost wholly confined to the removal into depot of the remains of the teak cut in former years by this department. The realizations from sales have been but insignificant.

32. During the year there have been 1,684 logs brought upon stock and placed in depot. The quantity sold is only 606 cubic feet, value Rs 1,212, the whole of which is realized; thus the balance of stock on hand at close of the year is cubic feet 72,598, valued at Rs 65,445, as compared with the balance on hand on same date of the previous year, cubic feet 34,488, valued at Rs. 37,091. With the prospect of the progress of State Railways, I do not think the valuation too high, as almost the whole of the timber is of such a class as will admit of storage without material deterioration.

33. The following Statement exhibits in contrast the income and charges of the year and the preceding one, regarding which comment is reserved as with regard to the other divisions :—

Year.	Receipts.		Total	Charges	Savings.	
	Unreserved forests	Reserved forests.			Surplus.	Deficit.
	Rs	Rs	Rs.	Rs	Rs.	Rs
1869-70	64,668	2,052	66,720	67,662	...	742
1870-71	73,803	2,951	76,754	34,867	41,887	...

EASTERN DIVISION.

Introduction, Statistical data, &c.,

34. Again this division affords but limited field for anything but a chief review, as the departmental operations have been almost confined to general protection of the tracts reserved, and artificial plantation. Mr. Foster, Sub-Assistant Conservator, has continued to conduct the duties, and I am sorry to say has been much incapacitated from ill health, against which I believe he has struggled perseveringly. During the year he has examined and reported upon the sál bearing country in the south of Raipur around the head waters of the Mahanadi, and the Zamindari forests of Korba to the east of Bilaspúr. I have myself on a previous occasion reported upon the former, and although there is a large extent of available waste over which sál grows abundantly and in its usual erratic way, yet I should not for the present advocate the demarcation of a State forest there, as from its remoteness it cannot be treated as other than a source of supply for the adjacent country, and I consider that its administration under the District authorities and reservation from sale will meet all emergency. The construction

of a line of railway to Chhattisgarh may, however, make material alteration in the circumstances of the whole of that part of the country, and the tract alluded to should by no means be overlooked, in case such an event should occur. With regard to Mr. Foster's explorations in Korba, no important information was recorded, and in my judgment the forests in that direction are quite out of reach of this department—in the first place, from their being private property, and secondly, from their extreme remoteness and inaccessibility.

35. As the other sections do not call for comment, I shall now proceed with—

Head I.—Section 4.

Management and improvement of forests.

Exclusion of fire.

36. Fire and cattle have been again excluded from the Háthíbárí forest, now for the third successive year, and Mr. Foster represents, with the most beneficial results. He states that seedlings are springing up in all directions in profusion, and that the increase in the general luxuriance of all vegetation is striking. The operation, too, has been effected at the trifling cost of Rs. 25 per month in addition to the pay of fixed establishment employed for the same purpose.

Plantation.

37. The details rendered by Mr. Foster under this head prove that he has carefully given effect to the prescribed rules and forms; they are exhibited in full in the tabular Statement attached; but, by way of summary, I may here state that the total area planted is 130 acres, containing 91,391 plants, at a total outlay of Rs. 19,444. This gives an average of 703 plants per acre at annas 3-5 per plant. The young trees vary from 12 feet 4 inches in height and 4¼ inches in girth down to the seedling, the dimensions of which cannot well be recorded. The reduced cash allotment in the budget for 1871-72 necessitates a considerable reduction in the scale upon which in future these operations will be conducted; and the very recent establishment of the plantation, only three years, scarcely warrants me in showing the rates of growth as ascertained by measurement, but no doubt these measurements will some time hence yield interesting information.

Head I.—Section 5.

Yield and working of forests.

38. The timber operations are confined to that felled in past years. The quantity brought on stock during the year is 191 teak logs, containing 3,907 cubic feet, which is the remains of what was felled in 1867 at Panabaras. These logs were conveyed to Baghnadi, on the Eastern road, where they should remain until sold or otherwise disposed of. The timber will bear storage without suffering rapid deterioration.

39. The timber referred to in para. 117 of last year's report has all been floated to Kamthi, and is now available there at from Rs. 1-12-0 to Rs. 1-8-0 per cubic foot. I am able to fix this low rate in consequence of the small outlay incurred in conveyance by water; but, although in this instance the outlay was small, yet I cannot represent the rivers Baghnadi, Waingangá, and Kanhán, as a reliable line of communication for the conveyance of large quantities of timber or its rapid delivery, and in future, timber work, should such be undertaken in Panabaras, delivery on the Eastern road will be found to meet the object in view.

Timber sales.

40. Sales only realised Rs. 576, but the stock on hand at commencement of the year has been reduced by the loss by fire of 717 sal logs which were in depot at Kantará nala. The origin of the fire could not be clearly traced, but there were suspicions it was the act of an incendiary, who seized on the absence of the man in charge to do the mischief. This loss reduces the stock on hand to 20,906 cubic feet of teak and sal, valued at Rs. 38,097.

41. As follows is the Statement of receipts and charges for the previous year and that under review:—

Year.	Receipts.		Total.	Charges.	Savings.	
	Unreserved forests	Reserved forests			Surplus.	Deficit
	Rs.	Rs.	Rs.	Rs.	Rs	
1869-70	52,968	551	53,519	25,143	28,375	...
1870-71	46,467	578	47 045	26,547	20,497	...

CENTRAL DIVISION.

Head I.—Section 1.

Area, boundaries, &c.,

42. This charge now consists of the Sátpurá reserve alone, that tract which was noticed in last year's report as the Deogarh reserve having been allowed, after careful consideration and discussion, to revert for the present to the control of the District authorities. Progress in the completion of the demarcation and the defining of blocks has been much impeded by the various changes within the year of the controlling officers, and I might add, in explanation of the expression "completion of the demarcation" used above, that great alteration in the main boundaries was found necessary as the Survey progressed. In the the first stage of the selection of these boundaries the lines were run from point to point as straight as the nature of the country and the areas conferred in proprietary right admitted. From this in many places large tracts of excess waste were found to lie between the boundaries of the forest and the limits of the village lands, the administration of which by the District officers would have been attended with difficulty and complication; consequently it was decided to rectify the reserve boundary, and make it correspond with those of the village lands, including the severances above referred to. I am unable to supply details of the progress of the work up to close of the year, as, owing to changes of officers, scarcely any field work was undertaken before the middle of February, and little or nothing was going on beyond protection by the ordinary establishment. Mr. McKee, the officer who had just there assumed charge, lost no time in organizing the establishment and getting to work upon the inner or block lines, the condition of which I was disappointed to find much more backward than the details with which I was furnished in 1869-70 led me to expect. Mr. McKee gives the following summary of work done up to date of his report: 488 small and 20 large masonry pillars have been erected on the outer boundary, of which latter 84½ miles, 80 feet wide and upwards have been cut, and 170 miles cleared; besides this, 116 miles of block line have been demarcated 20 feet wide, and 82 miles of the same cleared; one fire reserve has been formed. All squatter villages in the Eastern division and seven in the Western have been settled, leased, and their land marked off.

HEAD I.—SECTION 2.

Requirements of population.

43. This section calls for no comment here.

HEAD I.—SECTION 3.

Protection.

44. The arrangements continued unchanged from previous years, but as system advances increase of outlay on establishment must advance in proportion. The present fixed establishment is quite inadequate to perform the manifold duties of both supervision and prevention efficiently, and without more liberal arrangements the income cannot be realized to the extent it should, or the management of the forest be conducted on the most beneficial principles both in the interests of the population and Government.

Breach of Forests Laws.

45. There were 9 breaches of the Forest Act, for which 9 persons were prosecuted, 8 convicted, and 1 acquitted.

HEAD I.—SECTION 4.

Management and improvement of forests.

Exclusion of fire.

46. Fire was excluded from a tract with success, but the selection was not the most favourable which could have been made. The outlay was Rs. 1,211, and of course in the first year no actual improvement could be observed. Cattle were not so successfully kept out as they should have been, and I decided to abandon the tract in favour of two others which I selected in person; unfortunately, one of these was burned before the guard was empoyed, and it was found that the operation in the second would interfere with the rights of certain lessees, consequently it was abandoned until expiry of the current leases; and Mr. McKee reports that he re-occupied about six square miles of the tract conserved the previous year, and had up to date of his report preserved it successfully from fire and cattle. The cost of the proceeding for the season is calculated not to exceed Rs. 370.

Squatter villages.

47. Mr. McKee has also demarcated and assessed the few squatter villages allowed within reserve limits and given effect to the annual leases as prescribed. All risk of growth of title or claims has been guarded against.

Plantations.

48. No material alteration or increase having occurred since last report in the plantations, which are of quite trifling extent, I feel there is no call for enlarging upon the subject.

HEAD I.—SECTION 5.

Yield and working of forests.

49. Applications for permission to remove forest produce have not been so numerous as in other seasons, consequently there is a reduced income. This Mr. McKee attributes,—(1) to the commutation made by the District officer for the use of the excess wastes, (2) to the inaccessibility, as compared with past years, of the compartments of the forest thrown open to the public. I myself, however, attribute the reduction of income more to the unsettled management of the

charge from change of officers than to either of the other causes. The forest produce, exclusive of grazing, from which income was derived, is bamboos 194,125 and rafters 6,125. There have been no operations carried on under departmental control, except the making off of boundaries, consequently, I close this section with the Statement of receipts and charges.

Year.	Receipts.		Total.	Charges.	Savings	
	Unreserved forests.	Reserved forests.			Surplus.	Deficit.
	Rs.	Rs.	Rs	Rs	Rs.	Rs.
1869-70	60,457	13,249	73,706	21,901	51,805	...
1870-71	73,840	5,200	79,040	24,941	54,098	...

Head II.

Unreserved or district forests.

50. There has been a considerable increase of revenue over that realized in the past year, which the Deputy Commissioner ascribes to the introduction for the first time of commutation. The principle adopted was, on ascertaining the villages the inhabitants of which habitually had recourse to Government waste for, (1) wood and grass, (2) for pasturage, and (3) for both; those people coming under the first denomination were assessed at from 2 to 4 annas per house, collected through the Malguzar, and for this access was permitted to all Government excess waste without futher interference. Grazing rates were fixed at 1 anna per head for cows and bullocks, and 2 annas for buffaloes. For the third class both rates were collected, and the distinction was made on the returns of Patwarís as the most reliable data obtainable. About one-third of the villages in the district came under commutation, and miscellaneous forest produce was leased separately, while a duty was levied on wood, grass, &c., brought for sale to Jabalpur city by traders or others from the Government jungle. The Deputy Commissioner observes that commutation has not yielded so large a proportion of the income as might be expected,—only Rs. 7,900, and accounts for this from the very large areas of forest conferred in proprietary right in proportion to the Government excess wastes, as compared with other districts, by which the population is comparatively independent of the Government forests. The Deputy Commissioner further on this account expresses a doubt of the suitability of commutation for the district, in consequence of its only reaching so small a proportion of the people.

Jalalpur.

51. Here also there is an increase of Rs. 16,440, which the Deputy Commissioner attributes also to commutation. Of the whole income Rs. 26,314 have resulted from commutation; and the Deputy Commissioner remarks that, although the revenue is almost trebled as compared with that of past years, the system is more popular than the old one of farming.

Sagar.

52. There is an increase of revenue in this district also of over Rs. 6,000, which is to be accounted for, (1) from the inclusion of the income from Barelá, a pargana of Mandla, the receipts of which used to be credited to Jabalpur, and (2) from the revenue in other parts of the district having been for the year under report realized by direct management.

Mandla.

53. Commutation was introduced here, the population being divided into four classes and assessed by Punchayet at from annas 8 to annas 1 per class. The rates having been thus fixed, the Malguzar became the commutee, distributing the amount proportionately to the requirements of each person, and being allowed to compensate himself by a recovery of 3 per cent from the villagers. The distribution by the Malguzar was subject to revision, and required the sanction of the Deputy Commissioner, and the fact that only 31 villages out of the whole district declined to commute, they being independent of the Government jungles, is a fair illustration that the system is not unpopular, and the revenue, as compared with that of previous year, has maintained a fair level.

Damoh.

54. The system pursued here was partially the farming of usufruct leases and the retention of certain tracts under direct control There has been a trifling increase over the collections of the previous year which calls for no remark.

Narsinghpur.

55. There is a reduction of revenue, as compared with the past year, of Rs. 1,740, owing to grazing dues not having been realized in sufficient time for exhibition in the returns of the year. Every exertion has been made, but with indifferent success, to introduce commutation, and the Deputy Commissioner has hopes of more success next year by subjecting the people to the inconvenience of denying them access to the Government wastes until they accept the terms of commutation. It may seem unreasonable thus to resort to what may seem undue pressure, but, as remarked by the Commissioner of Division, since it is for the advantage of the people ultimately, and that Government is willing to forego a portion of the revenue in order to test the principle, it might prove beneficial.

Balaghat.

56. There have been two small tracts taken up as reserved forests by the Deputy Commissioner, under the sanction of the Chief Commissioner, and the timber is represented as of much promise. They remain for the present under the control of the District authorities.

57. Artificial plantation has also been carried on upon a small scale, and with some success, and the Deputy Commissioner represents the following advantages from sowing seed under the shelter of a peculiar dwarf species of *diospyros* which grows freely in the district:—

1.—Protection of the plants from being trodden down by cattle.

2.—The shading of the young plants from the hot weather sun.

58. The collections here show a decrease of nearly Rs. 3,000 in contrast with the preceding year, and the Deputy Commissioner anticipates further decrease still, the income of 1869-70 having been exceptionally large, while the completion of railway works must reduce demand for all sorts of timber and forest produce.

Hoshangabad.

59. The old system of leasing was pursued, and the Deputy Commissioner represents that from the remoteness of the forests there was much difficulty experienced in obtaining competition

60. As compared with 1869-70, there is a decrease of Rs. 3,347 in the income of this year. This contrast is, however, not quite fair, as in the year first mentioned Rs. 1,276 were improperly credited to district revenue, so that the actual decrease this year is only Rs. 2,000. There was no difference in the system pursued from that of the year before, *viz.*, ordinary usufruct leases sold by auction.

Betul.

61. The income of the year is in excess of that for 1869-70 by Rs. 9,708, but it should not be overlooked that the license system, under which the revenue of this district has been so enhanced during the past two years, was only in practice for nine months of 1869-70, pending expiry of the usufruct leases executed in the previous year. But in any case the Deputy Commissioner estimates that this year's income would have been in excess by about Rs. 3,000.

Nimar.

62. Captain Loch enters at considerable length into the working of the system initiated by Captain Forsyth, and in a general sense considers it eminently suited to the conditions of Nimar and its inhabitants. The system having been already described in former communications, and having undergone no alteration, I shall not remark further on it.

63. There has been an increase of revenue here also, as compared with that of 1869-70, amounting to Rs. 1,084, which though trifling in amount is noteworthy when it comes to be obtained in the face of certain restrictions on the felling of various sorts of timber,—in my judgment, an example which might be followed with most beneficial results in every district in the Provinces. In three tahsils the five best kinds of unprohibited timber were strictly preserved from being cut, and in one other tahsil they were not allowed to be felled when less than two feet in girth. These restrictions were put in practice in consequence of the exhausted condition to which all the most accessible forests of the district were reduced.

Nagpur.

64. The system was a varied one,—(1) by sale by villages, (2) one tahsil being divided into two blocks, the usufruct of which was sold in lump, and (3) direct management. The results of the latter proved the most remunerative, and all revenue was realized at close of the year.

65. Here, as in Nágpúr, the system has been one of combined direct management and usufruct leases. The revenue has maintained itself as nearly as possible, and the report calls for no further comment.

Wardha.

66. The system which has prevailed for administering the forests for some years past has been maintained this year unaltered. The demand of the year was estimated at Rs. 32,180, and the sum realized is Rs. 32,736, or an increase over the income of 1869-70 of Rs. 4,854. The Deputy Commissioner is of opinion that the number of prohibited timbers ought to be increased by the additionof "Mhowa" (*Bassia longifolia,*) and "Char" (*Buchanania latifolia*), which appear to be cut down in Chándá to an extent without precedent elsewhere. The Commissioner agrees with me that at present there appears no immediate necessity to make the act penal in a part of the country timbered to such excess as the district of Chándá.

Chanda.

67. The income has not reached that of last year by Rs. 4,873, but the Deputy Commissioner is sanguine as to the results of the forest year maintaining their usual standard, the above being the results up to close of the financial year. The rates for timber and bamboos have been considerably increased, apparently without checking the demand, and the Deputy Commissioner holds out prospects of the forest revenue still continuing to increase as the supply of timber in the adjoining States becomes reduced. There are export operations at present under experiment, but the proper time does not seem to have yet arrived for their review.

Sironcha.

68. The decrease in the income of this year, in contrast with 1869-70, amounts at close to Rs. 4,000. This was chiefly owing to the fact of the persons who last year bought the privi-

Raipur.

Timber Statement and timber stock.

78. Forms 24 and 25 exhibit the condition of our timber stock and the results of the operations. A slight error crept in to the closing balance of the last year's timber stock from 300 sleepers having been classed as logs. This has been rectified, and the correct opening balance consists of 23,459 pieces of timber and 20,784 sleepers. The receipts during the year are 3,303 pieces of timber and 11,370 sleepers, valued by estimate at Rs. 1,06,932. The sales consist of 5,171 pieces of timber and 15,252 sleepers, the aggregate value of which was Rs. 93,747. Reduction of stock by loss, deterioration, and other causes amounts to 5,667 pieces of timber and sleepers, valued formerly at Rs. 21,935; and, as pointed out in the end of para. 175 of the report for 1869-70, the further reduction in value of the remainder of the stock on hand amounts to Rs. 41,199, or a total of Rs. 63,134. The closing balance now consists of 32,826 pieces of timber and sleepers valued at Rs. 2,55,439.

79. The remaining Forms call for no explanation or remark.

Second Part General.—Head II.

General Remarks.

80. Comparison with the results of last year cannot be productive of material advantage. The enormous increase of income with the large reduction of charges would tend to mislead were it passed over without comment; as regards the former, I cannot but believe that the income is exceptionally high, and that the varied systems of realizing unreserved forest revenue require the test of further practice before accepting this year as a standard, and I feel it no less than a duty to place upon record that the reduced scale of charges is solely owing to the disorganized condition of the Forest Staff resulting from the repeated changes and absence of senior officers, and the delay and difficulty of supplying their places by competent men, which latter in my judgment is solely attributable to our present over centralized condition, and I feel confident that should the circumstance of this year's results be used as a basis of argument in favour of keeping charges down to a minimum, progress will not be made to the extent which might reasonably be calculated upon from the employment of experienced and energetic officers, whose zeal and interest in their occupation can only be secured by more liberal inducements than the present prospects of the department hold out.

81. The control and audit of accounts has been conducted during part of the year in the Conservator's office. The system has been fairly well established, but imperatively requires a better regulated and more continued supervision than it has had. The officer charged with the duty was transferred temporarily to a Division just as he had got into the routine and become acquainted with details, and the Conservator himself cannot be expected to exercise the required control while on tour, or indeed with an active staff and operations in fair progress can he be hampered with the drudgery of detail attendant on the duty without a more than corresponding loss of his services in camp.

I have the honor to be,

Sir,

Your most obedient Servant,

W. JACOB,

Offg. Conservator of Forests.

No. 21.

FOREST DEPARTMENT, CENTRAL PROVINCES

Annual Summary of Revenue and Expenditure in the different Divisions during the year 1870-71.

Classification	A			B			C			D			E			F			Total.		
RECEIPTS	Rs	A	P	Rs	A	P	Rs	A	P	Rs	A	P.	Rs	A	P	Rs	A	P.	Rs	A	P.
I.—Sale of timber at Depôts			..	176,560	11	5	68,366	12	7	2,873	6	0	576	8	0	760	3	0	2,49,137	9	0
II —Sale of timber removed by purchasers	..	..	.	16,218	6	0	2 550	3	2	1 494	6	3	31	8	0	5,285	9	2	25,580	0	7
III —Duty on foreign timber	..	..	..	..	..	..	..	..	..	..	..	..	..	..		..	..	..	..	..	
IV —Permit fees	..	..	..	49,624	2	7	86 959	12	10	64,895	14	4	41,879	8	0	34,586	0	9	2,77,925	6	6
V.—Grazing dues	..	..	..	23,250	1	2	10 013	4	0	4 687	3	5	307	4	9	3,127	3	2	41,385	0	6
VI.—Sale of fruits, &c	..	..	..	3 964	4	9	1 164	12	10	905	14	3	1 551	0	0	31,385	8	7	38,971	8	5
VII —Sale of confiscated timber	..		..	1,172	9	9	1 172	7	5	23	6	9	4	0	0	153	3	9	2,525	11	8
VIII.—Fines and forfeitures	..	..	..	99	6	6	992	11	7	68	8	6	7	7	2	157	13	5	1,325	15	2
IX —Miscellaneous	..	..	..	6,259	13	8	6,909	5	10	1 805	15	8	2,688	0	3	3,605	3	4	21,268	6	9
Total Receipts	..	..	..	2,77,149	7	10	1 78 129	6	3	76,754	11	2	47,045	4	2	79,040	13	2	6 58,119	10	7
CONSERVANCY AND WORKING																					
I.—Timber expenses	..		..	80,585	0	8	18,982	3	9	9,988	4	11	4,103	14	4	215	2	0	1,13,874	9	8
II.—Purchases of stock and cattle	..	..	..	887	14	8	1,294	0	0	1 586	8	0	756	10	0	431	7	0	4,956	7	8
III —Feed and keep of cattle	..	3,439	15	4	2,005	12	2	2 154	15	9	1,940	15	2	621	14	7	606	6	0	10,769	15	0
IV —Rent of leased forests	..	..	..		..			..	..	..	..	..				..		..	..	..	.
V.—Charges in collecting revenue on grass, &c	..	..	..	..	6 550	0	0	3,363	5	8	4,989	0	0	600	0	0	4,092	0	0	19,594	5	8
VI.—Plantations	..	..	..	..	3,960	1	7	3,758	13	1	107	4	0	11,497	3	9	790	12	8	20,054	3	1
VII.—Forest work	..	..		..	4,871	13	5	4 092	1	2	2	0	0	672	1	10	2,223	13	9	11,861	14	2
VIII —Forest Survey	..	..	..	..	..	..	..	745	5	7	2,196	9	2	..		..	135	13	4	3,077	12	1
IX —Experiments on timber	..	..	..	..	..	..		5	8	0	44	3	0		..			..		49	11	0
X. —Communications and Buildings	..	..	..	..	148	7	7	2 788	15	10	1,030	2	2	275	8	2	6,768	7	11	11,011	9	8
Total Conservancy and Working	..	3,439	15	4	98,949	2	1	37 185	4	10	21,884	14	5	18,527	4	8	15,263	14	8	1,95,250	8	0
ESTABLISHMENTS																					
I —Salaries	..	18,610	0	0	20,700	12	0	25,999	2	7	11,474	8	5	6 338	11	8	8,097	13	7	86,221	0	3
II.—Allowances	..	2,295	8	10	4 024	1	2	2 590	11	5	839	4	1	833	5	2	688	13	4	11,271	12	0
III —Contingencies	..	*6,396	5	1	2,334	3	2	3,550	5	8	668	14	1	848	6	0	891	4	3	14,689	6	3
TOTAL ESTABLISHMENTS.	..	22,301	13	11	27,059	0	4	32,140	3	8	12,982	10	7	8,020	6	10	9,677	15	2	1,12,182	2	6
GRAND TOTAL EXPENDITURE	..	25,741	13	3	1,26 008	2	5	69,325	8	6	34,867	9	0	26,547	11	6	24,941	13	10	3,07,432	10	6

* Includes Rs 5,021-5 2 on account of official postage.

No. 22.

FOREST DEPARTMENT, CENTRAL PROVINCES.

Dr. *Annual Abstract Account of the Cash transactions of the Forest Department in the Central Provinces for* 1870-71. Cr.

Heads of Account.	Rs.	A.	P.	Heads of Account	Rs.	A.	P.
To Cash in hand on 1st April 1870	24,359	10	8	By Expenditure of the Department ..	3,07,432	10	6
„ Revenue received	6,58,119	10	7	„ Remittances to State Treasuries ...	6,57,950	13	8
„ Remittances from State Treasuries	2,86,760	11	9	„ Repayments of Deposits	16,826	8	5
„ Deposits	16,557	5	1	„ Advances made	1,11,114	4	8
„ Advances recovered	1,31,287	11	7	„ Refunds of Revenue	11,549	11	9
„ Value of Teak Timbers received back from the Executive Engineer, Mhow	11,549	11	9	„ Public Works Department	1,496	12	0
				„ Cash Balance in hand on 31st March 1871.	29,846	14	7
Government of India—							
Military Fund	76	0	0				
Uncovenanted Service Family Pension Fund	433	8	0				
Income Tax..	2,052	1	0				
Official Postage...	5,021	5	2				
Total	11,36,217	11	7	Total ..	11,36,217	11	7

No. 23.

FOREST DEPARTMENT, CENTRAL PROVINCES.

ANNUAL Statement of Outstandings and Liabilities of the Department on account of Contractors and Disbursers.

DIVISION	Department Debtor.									Department Creditor.									Balances due.					
	At commencement of year.			Recoveries in cash, and value of supplies and work done during year.			At close of year.			At commencement of year.			Payments made during year.			At close of year.			To Department (outstandings).			By Department (liabilities).		
	Rs.	A	P.	Rs.	A.	P	Rs	A	P	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P	Rs.	A	P	Rs	A.	P.
Northern Division ...	4,246	3	1	1,58,364	5	7	1,62,610	8	8	1,07,544	10	5	86,740	12	4	1,94,285	6	9	42,813	3	1	11,138	5	0
Western Do. ...	...	...	...	64,283	7	10	64,283	7	10	24,266	11	7	53,639	13	2	77,906	8	9	13,623	0	11	...	...	...
Southern Do. ...	...	..	...	45,129	10	10	45,129	10	10	14,311	2	9	36,574	9	4	50,885	12	1	5,756	1	3	...	...	...
Eastern Do. ...	...	...	...	6,279	9	0	6,279	9	0	6,190	13	5	1,003	0	0	7,193	13	5	914	4	5	..	...	.
Central Do. ..	...	..	...	919	7	4	919	7	4	1,025	9	10	4,092	0	0	5,117	9	10	4,198	2	6	...	...	...
Forest Revenue. Reserved forests ...	...	...	...	2,42,453	13	8	2,42,453	13	8	1,64,706	9	7	87,748	13	9	2,52,455	7	4	10,001	9	8	...	..	...
Unreserved Do. ...	...	...	...	19,468	13	11	19,468	13	11	19,468	13	11	...	...	...	19,468	13	11	...	...	...	..	...	...
Total Rs. ...	4,246	3	1	5,36,899	4	2	5,41,145	7	3	3,37,514	7	6	2,69,799	0	7	6,07,313	8	1	77,306	5	10	11,138	5	0

No. 24.

FOREST DEPARTMENT, CENTRAL PROVINCES.

STATEMENT of Timber brought to Depôts from the different Forest Divisions during 1870-71.

Name of River or Division.	Forest.	Description of timber.	Pieces.	Cubic feet.	Totals of each River. Pieces.	Totals of each River. Cubic feet	REMARKS.
NORTHERN DIVISION ...	Gawarighat.	Sal logs.	1,595	4,115- 0-0			Transferred from Sakrighat.
Do. ...	Garhakota.	Teak logs.	61	362- 1-7	1,656	4,477- 1-7	
Do. ..	Mawi Topla and Saraka.	Sal Sleepers.	11,370	45,480- 0-0			
Do. ..	Mandla and Sakrighat.	Do.	13,061	52,244- 0-0			These sleepers were transferred from one Depôt to another.
Do. ..	Jabalpur.	Do.	12,012	48,048- 0 0	36,443	145,772- 0-0	
WESTERN DIVISION ...	Hoshangabad.	Teak.	91	700- 7-3			
Do. ...	Bagra	Do.	778	5,948- 3-2	869	6,648-10-5	
Do. ..	Bawargarh.	Do.	38	507- 0 5			
Do. ...	Saoligarh.	Do.	6	80- 6-4			
Do. ...	Bori.	Do.	126	1.505-11-0			
Do. ..	Bagra.	Do.	29	277- 4-9			
Do. ..	Hoshangabad.	Do.	276	2,463- 0-4			
Do. ..	Seoni	Do.	13	233- 6-2	498	5,067- 5-0	Received from Executive Engineer, Mhow.
Do. ...	Kapaghat	Do.	604	4,541- 8-5			
Do. ...	Bagra.	Do.	200	1,752- 4-0			
Do. ..	Hoshangabad.	Do.	115	836-11-1			
Do. ..	Seoni.	Do.	994	5,640- 6-1			
Do. ...	Sagar.	Do.	54	503- 6-0	1,967	13,274-11-7	Transferred from one Depôt to another.
SOUTHERN DIVISION ...	Chanda.	Do.	23	606- 0-0			
Do. ..	Talwara.	Do.	343	9,267- 1-0			
Do. ..	Allapalli.	Do.	1,318	28,843-11-0	1,684	38,717- 0-0	
Do. ..	Allapalli.	Do.	101	8,429- 5-0	101	8,429- 5-0	These logs were transferred from one Depôt to another.
Do. ...	Allapalli.	Sissoo.	4	81- 5-0	4	81- 5-0	
EASTERN DIVISION ...	Bagh Nadi.	Teak.	191	3,907- 0-0	191	3,907- 0-0	
	Kamthi.	Do.	285	8,685- 0-0	285	8,685- 0-0	Transferred from one Depôt to another.
					43,698	235,060- 2-7	

No. 25.

FOREST DEPARTMENT, CENTRAL PROVINCES.

ANNUAL Timber account for 1870-71.

Particulars.		Pieces.	Totals.
I.—Stock in hand at the following depots at the commencement of the year :—			
Northern Division.	Bheraghat, teak logs ..	338	
	Gawarighat do. ...	2,868	
	Sakrighat do .	1,595	
	Malkacharghat do and side pieces	50	
	Piparia do. ..	22	
	Khamarpani do. ..	76	
	Sagonghat do. ..	19	
	Birmanghat do. ..	48	
	Chanwarpatha do. ..	4	
	Balithari do. ..	24	
	Hirapur do. ..	41	
	Timbrawan do. ..	16	
	Butgaon do. ..	21	
	Mandla sal sleepers ..	2,086	
	Muwi and Saraka do. ..	9,801	
	Jabalpur do. ..	2,920	
	Sakrighat do. ..	2,786	
			22,715
Western Division.	Baurgurh, teak logs ..	4,044	
	Saoligarh do. .	3,524	
	Khamapur do. .	982	
	Harda do. ..	365	
	Kalibhit do. ..	33	
	Bori do. ..	3,946	
	Mattardeo do. ..	144	
	Sohagpur do. ..	319	
	Bagra do. ...	1,067	
	Rajaborari do. ..	791	
	Bagra sleepers .	98	
	Seoni do. ...	1,069	
	Bori do. ..	484	
	Sohagpur do. ..	592	
	Itarsi do. ..	340	
	Shahpur do. ...	407	
	Ratanpur do. ..	16	
			18,221

Particulars.		Pieces.	Totals.
I.—Timber removed by purchasers from depots :—			
Northern Division.	Gawarihat, teak logs ...	4,158	
	Bheraghat do. ..	52	
	Garhakota do. ..	61	
	Sal sleepers delivered to G I. P. R	14,003	
	Do. rejected and sold by auction ..	874	
Western Division.	Timbers supplied to Messrs Oog, Macbeth, and Pope ..	253	
	Do. to D. P W. at Pachmarhi .	200	
	Logs sold to private parties ..	113	
	Logs rejected and sold by public auction ..	277	
	Sleepers supplied to G I P. R. ..	139	
	Do do. to D P. W. ..	236	
Southern Division	From Nagpur, teak logs ..	7	
	„ Wardha do ...	2	
	„ Chanda do. .	12	
Eastern Division ..	From Raipur depot, sal logs ..	36	
			20,423
II —Timber lost —			
Northern Division	In floating operation, teak logs ..	126	
	At Jabalpur depot ..	45	
Western Division.	Returned to Ganesh Patel, teak logs ..	795	
	Rejected teak logs ..	1,304	
	In floating do. ..	19	
	Rejected sleepers ...	2,631	
Eastern Division ..	Burnt at Hathibari depot, sal logs..	747	
			5,667
III —Stock in hand at the close of the year at the following depots —			
Northern Division.	Gawarighat teak logs ...	305	
	Bheraghat do. ...	160	
	Malkacharghat do. ..	50	
	Piparia do. ..	22	
	Khamarpani do. ...	76	
	Sagonghat do. ...	19	
	Birmanghat do. ...	48	
	Chanwarpatha do. ...	4	
	Balithari do. ...	24	

Southern Division.	Ahiri	teak logs	101	
	Do.	shisham	27	
	Tulwara	teak logs	274	
	Alapalli	do.	298	
	Do.	shisham	2	
	Chanda	do.	112	
	Wardha	do.	88	
	Nagpur	do.	277	
				1,179
Eastern Division...	Brahmapuri	teak logs	46	
	KamtaraNala	sal do.	763	
	Hathibari	teak do.	231	
II.—Timber received at Depots from the forests during 1870-71, as per Form No. 24:—				
	Bagh Nadi	teak logs	285	
	Raipur	sal do.	49	
				1,374
Central Division...		teak stumps	569	
		do. sleepers	185	
				754
		Total pieces		44,243
II.—Timber received at Depot from the forests during 1870-71, as per Form No. 24:—				
Northern Division.	teak logs		61	
	sal sleepers		11,370	
Western Division.	teak logs		1,367	
Southern Division	teak logs		1,684	
Eastern Division	teak logs		191	
				14,673
		Total pieces		58,916

	Hirapur	do.	41	
	Timbrawan	do.	16	
	Balgaon	do.	21	
	Mhowa ke Sareka,	topla sleepers	8,110	
	Sakri ghat and Mandla	do.	5,921	
	Jabalpur	do.	10	
				14,827
Western Division.	Bawrgarh	teak logs	2,853	
	Saoligarh	do.	1,230	
	Kamapur	do.	982	
	Harda Handia	do.	51	
	Bori	do.	4,199	
	Mattardeo	do	144	
	Bagra	do.	2,074	
	Rajaborari	do.	400	
	Hoshangabad	do.	352	
	Seoni	do.	678	
	Sagar	do.	54	
	Khapaghat	do.	604	
				13,621
Southern Division.	Nagpur	do.	270	
	Chanda	do	123	
	Wardha	do.	86	
	Tulwara	do.	617	
	Alapalli	do.	1,717	
	Alapalli	sissoo	6	
	Ahiri	do.	23	
				2,842
Eastern Division...	Brahmapuri	teak	46	
	Hathibari	do.	231	
	Kamthi	do.	285	
	Bagh Nadi	do	191	
	Kamtara Nala	sal	16	
	Raipur	do.	13	
				782
Central Division...	Ghansor	teak stumps	569	
	Do.	do. sleepers	165	
	Banjari	do.	20	
				754
		Total pieces		58,916

No. 25. *(Continued).*

Abstract of Annual Timber account for 1870 71.

	No. of pieces.	Cubic feet.	Rate.	Value.			Total		
			Rs. A P	Rs.	A	P	Rs.	A.	P.
Opening Balance.									
Teak and Sal logs	21,835	199,488 7 6	1 11 0	1,95,369	0	3			
Shisham logs ..	29	693 11 0		520	9	0			
Side pieces ...	1,595	4,115 0 0		4,115	0	0			
Sleepers ...	20,784	83,136 0 0		1,04,849	12	0			
							3,04,854	5	3
Received during the year.									
Teak logs ...	3,303	54,702 5 0	0 13 9	47,240	4	0			
Sleepers ...	11,370	45,480 0 0	1 4 11	59,692	8	0			
							1,06,932	12	0
Total ...	58,916	387,615 7 6		4,11,787	1	3	4,11,787	1	3

		No of pieces.	Cubic feet.	Rate.	Value.			Total.		
				Rs. A. P	Rs.	A.	P.	Rs.	A.	P.
Sales.	Teak logs ..	5,135	25,352 3 4	1 1 2	17,131	5	8			
	Sal logs ...	36	787 8 4		576	8	0			
	Sleepers ..	15,252	61,008 0 0		76,039	4	6			
								93,747	2	2
Lost.	Timber given to Ganesh Parsad	795	5,071 10 11		2,200	0	0			
	Lost in floating logs ..	145	940 0 0		1,129	13	10			
	Do sleepers ...	45	180 0 0		236	4	0			
	Logs rejected ...	1,304	3,383 2 4		877	10	8			
	Sleepers rejected ...	2,631	10,524 0 0		10,416	0	0			
	Sal logs burnt in depot ...	747	9,433 0 0		7,074	12	0			
	Reduced the Estd,--value	...	...		41,199	13	1			
								63,134	5	7
Closing balance	Teak logs ..	18,542	212,774 5 11	0 15 1	1,80,542	7	3			
	Sal logs ...	29	496 0 0		372	0	0			
	Shisham logs ..	29	694 1 0		520	9	0			
	Sleepers ...	14,226	57,089 0 0		74,004	5	0			
								2,55,439	5	3
	Total ..	58,916	387,733 7 10		4,12,320	13	0	4,12,320	13	0

No. 26.

FOREST DEPARTMENT, CENTRAL PROVINCES.

STATEMENT showing the amount realized on account of the different classes of timber sold during 1870-71.

DIVISIONS.		Number of logs sold.	Cubical contents.				Amount realized and due on account of timber sold.			Average amount per 100 cubic feet.			REMARKS.	
			Cubic feet;				Rs.	A.	P.	Rs.	A.	P.	Pieces.	
Northern Division,	teak logs	4,271	76,493	0	7		85,434	6	5	111	0	7	Timber sold in previous years remaining unremoved at the commencement of the year ..	20,423
Do. do.	sal sleepers	14,877											Timber sold during year.	20,423
Western Division,	teak logs	843	9,260	2	11		6,523	4	8	70	7	1	Total ..	
Do. do.	sleepers	375											Timber remaining unremoved at the close of the year	
Southern Division,	teak logs	21	606	11	10		1,212	15	1	200	0	0	Balance removed from Depots by purchasers during the year ..	20,423
Eastern Division,	sal logs	36	787	8	3		576	8	0	73	3	0		
Total ...	...	20,423	87,147	11	7		93,747	2	2	107	9	2		

Deduct amount due, but not realized during the year ...	10,001	9	8
Balance	83,745	8	4
Add amount realized on account of former years	1,64,455	10	2
Amount collected by District Officers	986	2	9
Total shown as revenue on account of timber sales	2,49,187	5	3

No. 27.

FOREST DEPARTMENT, CENTRAL PROVINCES.

STATEMENT showing the amount expended on account of Timber received from the different Forest Divisions during 1870-71.

Names of Divisions.	Number of logs.	Cubical contents.				Timber expenses.			Conservancy expenses, cost of establishment, &c., of the Department, including direction.			Total amount expended, including direction.			Average amount paid per 100 cubic feet.			Remarks.
		Cubic feet.				Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
Northern Division, teak logs	1,656	1,50,249	1	7		80,585	0	8	25,285	11	9	1,05,870	12	5	70	7	4	
Do. do. sleepers	36,443																	
Western Division, teak logs	2,836	19,923	10	0		18,952	3	9	27,745	13	3	46,698	1	0	234	6	3	
Southern Division do.	1,785	47,227	10	0		9,988	4	11	15,013	12	11	25,002	1	10	52	15	0	
Do. sissoo	4																	
Eastern Division, teak logs	476	12,592	0	0		4,103	14	4	13,796	1	6	17,899	15	10	121	8	7	
Central Division	...	...				215	2	0	14,937	8	10	15,152	10	10	...	...	...	
Grand Total...	43,200	2,29,992	9	7		1,13,874	9	8	96,779	0	3	2,10,653	9	11	...	...	...	

N.B.—Sal logs and side pieces, 1,595, containing 4,115 cubic feet, are included in the Northern Division portion of the expenditure of the year being on account of this transport.

Sal sleepers ...	25,073	do.	100,292	0	0	do.	do.	do.	(of timber from one depot to another.)
Teak logs ...	1,967	do.	13,274	11	7	do.	do.	in the Western Division	do. do. do.
Teak and sissoo logs	105	do.	8,510	10	0	do.	do.	Southern do.	do. do. do.
Teak logs ...	285	do.	8,685	0	0	do.	do.	Eastern do.	do. do. do.
Total ..	29,025	do.	1,34,877	9	7	cubic feet.			

498 teak logs, containing 5,067 3 0 cubic feet, received back from Executive Engineer, Mhow Division, is not included in the Northern Division.

No. 28.

FOREST DEPARTMENT, CENTRAL PROVINCES.

Annual Account of Forest Revenue for the year 1870-71.

	Rs.	A.	P.
Receipts	6,58,119	10	7
Expenditure	3,07,432	10	6
Surplus	3,50,687	0	1
(Subtract) difference between Assets and Liabilities at the commencement and close of the year	2,55,819	10	2
Net Revenue	94,867	5	11

Detail of difference of between Assets and Liabilities at the commencement and close of the year.

	At the commencement of the year.			At the close of the year.			Difference. In favour of the year.			Difference. Against the year.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs	A.	P.
Value of timber and other stock	3,04,854	5	3	3,02,350	10	10	..			2.503	10	5
Outstandings on account of sales and excess payments to Contractors	3,37,514	7	6	77,306	5	10	...			2,60,208	1	8
Total Assets... ..	6,42,368	12	9	3,79,657	0	8	..			2,62,711	12	1
Deduct Liabilities.. ..	4,246	3	1	11,138	5	0	6,892	1	11	...		
Balance... ..	6,38,122	9	8	3,68,518	11	8	6,892	1	11	2,62,711	12	1
Net difference against the year ..										2,55,819	10	2

APPEDNIX R.

PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

PROVINCE OF BRITISH BURMA.

1870-71.

BY CAPTAIN W. J. SEATON,
CONSERVATOR OF FORESTS.

REVIEW BY THE CHIEF COMMISSIONER.

No. 382-51 F, DATED 25TH AUGUST 1871.

From—LIEUT.-COLONEL W. S. OLIPHANT, R. E, *Secretary to the Chief Commissioner, British Burma, Public Works Department.*

To—*The Secretary to the Government of India, Department of Agriculture, Revenue and Commerce.*

I am directed by the Chief Commissioner to submit the Annual Report on the Forests of this Province for 1870-71. The Report has been very carefully prepared by Captain Seaton, the Conservator, and calls but for few remarks from the Chief Commissioner more especially as he has had, as yet, but little opportunity of making himself acquainted with the general operations and system of the Department.

2. Regarding the work of demarcation, a matter admitted to be of great importance both by General Fytche and the Government of India, it may be said fair progress has been made. The Government of India have been kept informed, from time to time, of the progress made in the preliminary demarcations and it is satisfactory to note from the 4th para of the Report that very nearly 49,000 acres have been finally demarcated. It seens however to Mr. Eden that eventually a more permanent kind of boundary mark will be necessary than that adopted by the Conservator and that some outlay will have to be incurred in the erection of masonry pillars at the more prominent points.

3. It appears from the 19th paragraph of the Report that propositions will be laid before him by the close of the year for demarcating State Reserves for the whole of the Prome District. These proposals will be awaited with interest and as soon as orders have been passed on them, the Chief Commissioner will issue his instructions for similar concentration of work in the Myanoung District.

4. The examination of tracts (paragraph 24) suitable for Railway Fuel Reserves was ordered by General Fytche. Whether the Railway be constructed or not, the demarcation of such tracts will always be of value, holding in view the natural increase in population and consequent extension of cultivation under a wasteful system. With such Reserves under proper control, an additional source of revenue is thus opened up to the Forest Department and it is always open to Government to surrender them if in the course of time it is found that they are not required.

5. The Conservator refers (paragraph 32) to the orders of General Fytche regarding the people being allowed the privilege of collecting wood in the State Reserves and he remarks that he has addressed the Local Government on the subject. A letter has been received in this office and will receive the Chief Commissioner's early attention. The subject is one of some difficulty and the Chief Commissioner will be careful that due consideration is shewn to the interests of the people.

6. The attention of the Commissioner of the Pegu Division will be drawn to the remarks made by Captain Seaton in his 37th paragraph regarding trespass within the State Reserves. One of the main objects in demarcating these Reserves was the throwing open large tracts for the full use of the people, the Government reserving to itself strict rights of occupancy in the Reserves being, at the same time, willing to grant, under some restriction, the inhabitants of the vicinity such privileges as they had hitherto enjoyed. It is therefore necessary that the Government rights should be jealously watched and this can only be attained by cordial co-operation between the District Officers and the Officers of the Forest Department.

7. The question of the proprietary rights of the Government to teak timber in the Western Prome Forests (paragraphs 48 and 49) has not been laid before the Chief Commissioner and until he had read the Conservator's report he was unaware that it had ever been raised. The proceedings will be called for and examined, . The Conservator should have taken the orders of Government in the matter at an earlier stage. The Draft Forest Bill, now under consideration, however makes distinct provision for including these Forests within certain limits which will have to be suggested by the Conservator.

8. On Plantations, Rs. 31,282 have been expended. It is not possible to ascertain from the Report (paragraphs 114—166) the actual area now under cultivation throughout the Province and the Conservator will accordingly be requested to submit some more detailed information on the subject, together with a statement shewing the outlay on each plantation.

9. The intention of the late Chief Commissioner was to concentrate plantation work as far as possible in the vicinity of Rangoon and this was accepted by the Government of India in letter No. 632 F of 20th October 1870 though it was not considered advisable to abandon any plantations already existing. Since the commencement of the current year (1871-72) the Conservator has reported that it will not be possible to make up such a large area in the immediate vicinity of the town, but that land is available further Northward at a distance of about 50 miles from the Port.

10. Captain Seaton shews, in the 129th, 131st and 145th paragraphs, the indirect benefit attending the growth of vegetables, fruit and other trees with the young teak. It would have been well had the Conservator shewn the financial aspect of this system more concisely for all the plantations so that an idea might have been formed of the sums returning to the Government as a set off to the cost of the plantations.

11. The yield of the Forests, both within and beyond British territory, appears very satisfactory when compared with former years. It may be useful here to note the quantities in tons rendered available during the five years ending with 1870-71 :—

	British.	*Foreign.*	*Total.*
1866-67	31,549	55,867	87,416
1867-68	33,104	73,703	106,807
1868-69	52,258	62,509	114,767
1869-70	39,843	44,184	84,027
1870-71	57,086	65,482	122,568

The Chief Commissioner remarks that the measurement of the timber imported from beyond the Frontier should be specified in the Report. The present system of recording the quantity imported according to number of logs appears inconvenient, more especially as both the number and measurement of British grown timber are stated.

12. The gross revenues for the above period (1866-67—1870-71) were as follows :—

	British.	*Foreign.*	*Total.*
	Rs.	Rs.	Rs.
1866-67	2,98,498	1,25,555	4,24,053
1867-68	4,61,836	1,85,755	6,47,591
1868-69	6,03,908	2,14,004	8,17,912
1869-70	8,46,327	1,38,549	9,84,876
1870-71	6,68,157	1,49,967	8,18,124

13. The net receipts were :—

1866-67	1,38,917
1867-68	3,19,204
1868-69	3,94,783
1869-70	5,65,268
1870-71	4,17,975

14. From these figures it appears there is a falling off of about 1½ lakhs of rupees both in the gross and net revenues when compared with the year 1869-70. Mr. Eden thinks it would have been more satisfactory had the Conservator attempted to shew the causes of this decrease. The Conservator has however supplied the required information in a separate communication and I am to extract it here as supplementary to the Report :—

" At the close of 1868-69 there was an unusually large stock of timber
" on hand at the Government Timber Depôt and as the demand was excessively

" good for first class timber in the rains of 1869 and subsequently, the Depart-
" ment was enabled to dispose of a very large quantity of timber at very re-
" munerative prices, thereby considerably enhancing the revenue anticipated
" for 1869-70.

" During the year 1870-71 however, the position of the Department
" was very different, neither was the stock of the timber on hand at the com-
" mencement of the year so large nor was the market sufficiently brisk to war-
" rant sales being held for several months at the close of the year.

" Towards the very end of the year there was a slight improvement in
" the tone of the market which enabled the Department to dispose of a small
" quantity of timber and thereby bring up the revenue to the minimum noted
" in the Budget estimate."

15. The Chief Commissioner will look with interest for the Report of 1871-72, as it will shew the extent to which the financial working of the permit system will have been affected by the introduction of the new assessment referred to in the 187th paragraph of the Report under review. The Conservator will be asked to shew what the permit revenue would have been under the former system and then compare it with the revenues derived under the one now in force.

16. The Chief Commissioner would invite the attention of the Government of India to the remarks recorded in the 222nd and 223rd paragraphs of the Report relative to girdling. If the conclusions arrived at by Mr. Broughton are considered sound by the Government, then it would appear that there is nothing deleterious in the practice and this vexed question may therefore be considered to be now set at rest. It will be remembered that the matter was referred to in Colonel Fraser's review of the Forest Report for 1868-69 and commented on by the Government of India in their orders thereon.

17. Mr. Eden desires to notice favourably the services rendered by Captain Seaton who has always given great care and attention to his important duties. The Officers specified by the Conservator in the concluding paragraph of his Report, also deserve commendation.

CONSERVATOR'S REPORT.

Annual Report, dated 3rd August 1871, on the management and conservancy of the British Burma Forests for the Financial Year 1870-71, by CAPTAIN W. J. SEATON, *Conservator.*

SECTION I.

INTRODUCTION.

SPECIAL.

Nothing of interest has to be recorded in addition to what has been noted in Forest Administration Report for 1868-69.

FOREST LEGISLATION.

2. Under this head has to be recorded that, on a reference by the Local Government with a view to legalizing duty on Foreign timber, between 4th June 1863 and 2nd August 1865, the period uncovered by Act VII of 1869, the Legislative council passed Act XXV of September 1870, legalizing duties levied on Foreign timber imported into Maulmain by the river Salween between 1st July 1864 and 2nd August 1865 inclusive.

FIRST PART—SPECIAL.

1. STATE FORESTS AND LEASED FORESTS.

3. The final demarcation as State or Reserved Forests of the following additional tracts has been sanctioned by the Local Government in letter No. 381-31 F, dated 25th July 1870, and Resolutions No. 460-31 F, dated 18th August 1870, No. 765-31 F, dated 9th December 1870, No. 953-31 F, dated 16th February 1871 and No. 109-11 F dated 29th May 1871 :—

	Acres.
Myanoung district.	
Kangyee	3,801
Lower Payagyee	572
Mokkha	7,200
Beeling	6,880
Prome district.	
Upper Khyoung-zouk	3,456
Nyoung-ben Tsway	3,072
Middle Khyoungzouk	2,880
Gway-cho	6,720
Daulay	1,760
Padet Myoung (reduced area)	4,160
Khyouk-kee Doung	2,560
Salween district.	
Tsinsway	8,960
Moo-choung (reduced area)	2,200
Wah-moo choung	1,760
Prome district.	
Shwè kyun Dau or Royal Forest (reduced area)	238
Total	56,219

4. The boundaries of the following tracts have been finally demarcated as laid down in Rule XIV, Forest Rules.

Prome district.

	Reserved Forests.	Acres.
Khyoungzouk	Upper Khyoung-zouk	3,456
	Nyoungben Tsway	3,072
	Middle Khyoung-zouk	2,880
	Gway-cho	6,720
Shwèlay	Daulay	1,760
	Padet myoung (reduced area)	4,160
	Kyoukyee Doung	2,560
	Bwet	2,887
Shaboung	Shaboung	2,229

Myanoung district.

Toungnyo	Upper Padinben	560
	Lower do.	241
	Upper Tapan	1,015
	Lower do.	675
	Nyan-lay	5,840
	Pazinjay	1,280
	Kannee	768
Mimboo	Upper Payagyee	1,041
	Lower do.	572
	Thitcho	1,414
	Kangyee	3,801
Boben	Gway-doukt-san	1,306
	Choungwah	744
	Total	48,987

5. The area of the Lower Payagyee Reserved tract will be less than what is shewn above, if the original survey is correct; it having been deemed expedient to rectify the Western boundary, to exclude the villages and paddy lands of Payagyee, as the villagers declined to leave and accept compensation. The tract requires to be re-surveyed.

6. The demarcation of boundaries was conducted in the following manner:—

Wherever the boundary was not an established road or bed of a stream, a path, averaging from six to ten feet in width was cleared of all jungle except trees of very large dimensions.

Boundary marks consisting of teak boards 18″ × 12″ × 1″ painted white and numbered in Burmese characters from 1 to 100 in black paint, and with the word ∞ဖိုးရ signifying "Government," painted on the upper part, were affixed to living trees at intervals of one hundred yards along the cleared lines and at all points where the boundaries are intersected by paths, roads or streams.

To protect them from fire and injury from passers by, the marks were put up at a height of from eight to ten feet from the ground and secured with four inch nails.

7. The expenditure under different heads in the Tharrawaddie Division was carefully noted and found to give the following average of cost per mile:—

	RS.	A.	P.
Clearing paths	2	10	4
Cutting, painting, transport, and affixing boards	7	14	4
Or a total cost of demarcation per linear mile	10	8	8
Or per square mile demarcated	18	9	5

Where more natural boundaries can be selected, the cost, per square mile will consequently be diminished.

8. The details of the work in the Prome division have not yet come to hand.

9. The preliminary demarcation of many of the tracts having taken place as far back as in 1865 and 1866, great difficulty was experienced by the Tharrawaddie Divisional officer, Mr. Macpherson, in tracing the boundaries, the original marks on the trees having in many instances, been quite obliterated by growth of sapwood. It was, further, with no little difficulty, that people could be found to point out the original boundary lines. This also considerably retarded the progress of the work.

10. Owing to this and the withdrawal of all the available junior officers for employment in the selection of tracts for reservation in the Prome district, it was not possible to complete the demarcation of all the reserved tracts this season.

11. The boundaries of the following reserved Forests will have to be demarcated early next season :—

Prome district.

	Acres.
Oopaulangyee	1,362
Oopanlangalay	515
Yeytha	403
Shwè Kyun-Dau	238

Myanoung district.

Toungnyo-Hill	3,520
Mokkha	7,200
Beeling	6,880

Shwègyeen district.

Tsinsway	8,960
Moo-choung	2,200
Wah-moo-choung	1,760

12. In accordance with the orders of the Local Government, a Register has been opened for reserved or State Forests. They are numbered from 1 upwards, and full information relative to estimate of growing material and boundaries, is recorded against each.

13. In the Provincial map made on a scale of 3 miles to 1 inch and mentioned in paragraph 42 of Forest Administration Report for 1869-70, these reserved Forests have been entered with their respective register numbers and marked with the initial letters also of their several divisions.

14. The work of selection and preliminary demarcation of Forest tracts as State Forests has, with the sanction of the Local Government, been chiefly confined during the year to the Prome division where, as repeatedly mentioned in previous Administration Reports, the Forests are, more than elsewhere, threatened with destruction by *toungya* or hill cultivation. The work embraced the selection of tracts abounding not only in teak but the more valuable trees such as Padouk (*Pterocarpus dalbergioides*), Koko (*Albizzia Lebbeck*), Cutch (*Acacia catechu*), Pynkadoe (*Xylia dolabriformis*).

15. Operations commenced in the first week of December and were not altogether suspended when the rains set in. During this lengthened period an examination was effected of all the hill tracts at the sources of the Nawing and

Boolay streams and their tributaries. To insure the completion of the work if possible in one season, four Assistant Conservators and one Forest Ranger were withdrawn from other divisions and placed temporarily under the orders of Mr. Elsner, the Prome divisional officer, making in all a staff of six Gazetted officers and one Forest Ranger employed in the selection and preliminary demarcation of reserved tracts in this division.

16. A staff of native surveyors was also employed in the survey of the main streams, their tributaries and the watershed ranges.

17. Consequent upon the dryness and heat of the Prome Forests, the precipitous character of the hills and difficulties of access, the duties devolving upon the European officers were of a very arduous and trying nature, involving in fact an unusual amount of physical strain and exposure: considerable alterations had to be subsequently made in the arrangements for the regular progress of the work and original disposition of the officers, two of whom had to be withdrawn by reason of indisposition. This, together with the death by fever of one of Mr. Elsner's principal Native subordinates, tended greatly to retard the satisfactory progress of the work, and increased materially the difficulties connected with the control of it on the part of that officer.

18. The results may be thus summed up :—

Boolay and Pudday district.

Sources of the Bangoong ... Choun-goun-gyee and its tributaries ..... Pudday and its tributaries ...	Examined by Assistant Conservator Monng Poh O in December, January and February.

North Nawing district.

Higher part of North Nawing.....	Sub-Assistant Conservators Messrs. G. Stratford and A. L. Hough in February.
Source of Gna-moony-zin choung...	By Sub-Assistant Conservator A. L. Hough, in March.

Tsoon Choung district

The entire valley of the Tsoon-choung	Sub-Assistant Conservators Messrs. G. Stratford and A. L. Hough, in December, January and February.

Middle Nawing district.

From Auloo-sway upwards, the entire area drained by the Middle Nawing and its tributaries	Assistant Conservator Mr. A. P. Aylmer, from December to April, inclusive.

South Nawing district.

Middle portion	Assistant Conservator Mr. A. M. Buchanan in January and February.
Sources of the South Nawing.	Assistant Conservator Moung Poh O, in March and April.
The Bamboong and its tributaries .... The entire Maha-tha-man district	Forest Ranger Moung Way, from January to May, inclusive.

19. The position and resources of the teak and other rich tracts suitable for demarcation have been ascertained, their boundaries have been surveyed,

and when maps of the whole have been compiled probably about the close of the year—the Department will be in a position to submit definite proposals on the subject of reservation for the entire Prome District.

20. The Local Government having approved of the demarcation "*en bloc*" of the higher Hill tracts within 3 to 5 miles of, and parallel to, the Yomah range, certain areas within them chiefly void of teak, were selected and surveyed as blocks, within which *toungya* cultivation is in future to be restricted.

21. As the upper Hill tracts will thus form one continuous block between the Yomah on the East, and a line of natural boundaries almost parallel to it on the West, the demarcation of the tracts in contiguity with the higher hills will be greatly simplified, and a large area of wooded country retained under Forest conservancy to meet the fast increasing wants of the population to the Westward. The strongest argument in favor of this procedure is, that it effectually prevents the denudation of all the higher hills by *toungya* cultivation and the baneful effects on climate and temperature arising from it.

22. To the Westward of the upper Yomah block, the Reserved tracts will comprise a series of detached blocks varying greatly in size; while, outside their limits, it is proposed to class the Forest tract as "unreserved," and exempt them from all restrictions against *ya* cultivation.

23. The results to be anticipated may be thus enumerated.

1st.—The area subject to the Forest rules will be greatly reduced.

2nd.—The safety of all valuable areas from destruction by *toungya* cultivation, will be secured,

3rd.—Constant conflicts with, and prosecutions of the people, for breaches of Rule IX, will cease.

24. During the year, Mr. Hume, was employed in the examination of tracts suitabe for "Fuel Reserves" along the Prome and Rangoon road. The following information was obtained.

Approximate area of wooded land available within 3 miles of the projected line of Railway between the 40th and 130th mile stones	about 40 Sq. miles.
Average yield of fuel per acre	„ 15 Tons,
Average annual increase on the mass...	„ 5 Per cent.
Period required for existing trees to attain an average girth of 30·66 inches, after the entire mass has been removed	„ 29 Years.

25. A map of the several blocks is in course of formation and reports are about to be submitted to the Local Government regarding additional areas available for Fuel Reserves, particularly between Rangoon and the 40th mile on the Prome road, and the areas near Prome suitable for formation of Fuel plantations.

26. The areas preliminarily demarcated, and for the reservation of which as Fuel blocks, proposals have been submitted to the Civil authorities, are:—

Rangoon division.

	Acres A. P.
Between 39th and 42nd mile stones of Prome road	1,689- 0- 0
Between 43½ and 47 miles	1,601- 7-10
Do. the 50th and 55th mile stones	5,087-11-10
	8,379- 1 -6

No *toungya* cultivation in teak localities has been reported.

44. *Tharrawaddie Division.* No breaches of Rules have been discovered. From the reports of the several Districts Foresters, it appears that 1191 *toungyas* were inspected and found to contain 843 teak trees of which 31 only had been destroyed.

45. *Prome Division.* The examination of the Tsoon-choung and Allav Nawing Districts this season brought to light several flagrant cases of infringement of the Forest Rules, and the fact that large areas of valuable Forest have within the last few years been destroyed by *toungya* cultivation.

Everywhere the encroachment on the original Forest has progressed at such a rate, as fully to warrant the prediction that in another decade nothing will be left but small isolated patches of Forest surrounded by vast wastes of low jungle in different gradations of age, studded with the mutilated and charred stems of the large trees that once covered the ground in one almost unbroken mass.

To understand the difficulties connected with the present system of Conservancy and the necessity for restricting *toungya* cultivation *in toto* within well defined limits, one has only to penetrate into the Prome hill tracts and observe the facilities that everywhere exist for evading Rule IX, Forest Rules.

46. During the year, 19 cases of breaches of Rules VI and IX, involving the destruction of 163 teak trees, were referred to the District Courts : the results have not been reported. Five cases involving destruction of 64 teak trees were tried by the Conservator in the Forests and fines varying from Rs. 10 to 15 inflicted in each case.

47. Of four persons tried for theft of timber in the District Courts, under the Indian Penal Code, one was convicted and sentenced to a fine of Rs. 165.

48. With a view to solve the question of the proprietary right of Government to teak timber in the Western Forest, Proceedings were instituted in the Deputy Commissioner's Court, Thayetmyo, in a case of appropriation of teak timber under Section 403 of the Indian Penal Code. It was urged that although the Western Forests were not included in the Government Forests defined in the Forest Rules of 1865, yet the timber in them was Government property by reason of the proclamation of the Local Government dated 26th September 1853, declaring all the Forests in the Province of Pegu to be the property of Government. The case was thrown out, evidence of ownership being deemed insufficient on the ground that the above proclamation was abrogated by Act VII of 1865.

49. Yet, permission to work the Western Forests for 12 years, was granted in 1862, under the authority of the Government of India ; and the Forest Department continues to collect Revenue on timber extracted from them as sole proprietor of the timber—a very anomalous position for Government and one which can only be rectified by the Western Forests being brought within the limits of the Government Forests as has been proposed in the amended draft of Forest Rules.

50. *Sittang Division.* No breaches of Forest Rules have been reported in this Division.

51. *Salween Division.* Proceedings were held by the Deputy Conservator in 15 cases of breaches of Rule XIX, Forest Rules. Of the defendants 18 were convicted and fined from Rs. 5 to Rs. 50 each, and the remainder, 6 in number, were acquitted.

52. The following cases involving breach of Forest Permit conditions, were also tried.

Upper Salween District, 2nd division

Breach of clauses VI and IX, disposing of timber in the Forest without authority.	Permit cancelled by the Chief Commissioner in Revenue Miscellaneous No. 20, dated 29th April 1871.

Houndraw Forest, breach of Rule XI—Acquitted.

53. The destruction of 50 teak trees involving a breach of Rule IX, Forest rules, was discovered by the Forester of the Upper Salween division. The parties concerned are about to be prosecuted in the district Court at Pahpoon.

54. In the other districts no beaches of this rule by *toungya* cultivators have been reported, although the periodical examination of *toungyas* was carried out.

55. During the year, proceedings were held in 26 cases involving breaches of Kadoe Rules—(Schedule VII, Forest Rules). Of the defendants 19 were fined in sums varying from Rs. 5 to Rs. 50 ; one was acquitted ; and, of the remainder, their timber was detained.

56. Theft of timber and defacement of marks on drift timber, are considered by Mr. Slym to be greatly on the decrease, owing partly to the greater vigilance of the Departmental Subordinates, and partly to the exclusion of a great number of petty traders from the timber trade.

4.—MANAGEMENT AND IMPROVEMENT.

(a). Girdling Operations.

57. Besides the operation of the year under review, those undertaken at the close of the preceding year have also to be recorded as noted in paragraphs 34 and 35 of Forest Administration report for 1869-70. The work throughout was conducted in accordance with the Rules and in the order prescribed in the Revised Working Plan of 1868, except in the following instances.

58. *Salween Division.* In the Yoonzaleen district, it was deemed advisable to girdle only 1000 trees, several hundred trees having been killed without authority by the Permit holders as recorded in Forest Administration report for 1869-70,

59. *Prome Division,* Instead of the Tsoon-choung district, the site selected was the Gnamoizin Sub-district in the North Nawing district, the latter tract having been destroyed by *toungya* cultivation and not being worth reservation. This procedure was authorized in letter No. 528-4 F of the Local Government dated 28th September 1870 on the proposition of the Conservator to limit girdling operations as far as practicable to those tracts over which, by reason of their position and poor resources in standing timber, it would be advisable ultimately to abandon conservancy.

60. The results of the work in 1869-70, and the past year are as follows :—

Divisions.	*Districts.*	*Number of trees for 1869-70—70-71. Noted in working plan.*	*Girdled in* 1869-70	*Girdled in* 1870-71.
Rangoon... ...	Bauneo.....	4,000	„	4,000
	Pounglin...	2,000	„	2,000
Tharrawaddie	Shaboung.....	3,000	„	3,029
	Minhla.....	4,000		4,025
Prome..... ...	Boolay.....	2,000	2,000	„
	North Nawing	1,000	„	1,000
Sittang.....	Gwaythay	1,000	1,015	„
	Bimbyay.....	1,000	1,014	„
	Moong.....	1,000	„	1,200
	Padah.....	1,000	„	1,150
Salween	Yoonzaleen.....	2,000	1,000	„
	Beeling.....	2,000	„	2,000
		24,000	5,029	18,404

Thus 23,433 trees have been killed by the department and added to the stock of standing timber available for removal.

61. The suspension of all Forest operations in the dry season of 1869-70 will explain the fact of the prescribed number of trees for the Tharrawaddie division being all killed during the past year.

62. Full information regarding the Sub-districts in which the work was carried on will be found detailed in Statement II.

63. With the exception of the districts in the Rangoon division and the Yoonzaleen district of the Salween division, the immediate control and management of the work were left to the Forest Rangers as directed in the Working Plan, thereby freeing the Gazetted Officers for other employment.

64. The work was revised in every instance by divisional officers, except in the case of the Moong and Padah districts owing to Mr. Graham being incapacitated by ill health, and in the case also of the Beeling district, which the Divisional Officer was unable either to visit in person or depute an Assistant Conservator to do so, owing to the latter's temporary withdrawal to the Prome Division.

65. The work was inspected by the Conservator in the Padah district, Sittang division, and Shaboung district, Tharrawaddie division. In the former, the trees did not appear to have been judiciously selected in every instance, and the general management of the work in progress indicated inattention to details on the part of the Forest Ranger.

66. In the Shaboung district the work was found to have been satisfactorily carried on. This also appeared to be the case in the Minhla district, a part of which was also visited by the Conservator.

(*b*). Blasting Operations.

67. With the sanction of the Local Government, these operations were entirely suspended to admit of the vigorous prosecution of demarcation work in the Prome division.

(*c*). Clearing of Streams.

68. A sum of Rs. 200 was expended by Forest Contractors in the Tharrawaddie division, in clearing away the jungle, obstructing the passage by which timber is floated from the Toung-choung into the Gam-oong stream, the only outlet into the Meimakha river.

(*d*). Survey and Examination of the Forest.

69. As noted in paragraph 14, this important work has been carried on entirely in the Prome division in connection with the selection of tracts for reservation. Detailed results of the valuation surveys will be found in Statement I.

Prome Division.

70. *Boolay district.* The Forests in this district comprise five distinct blocks readily distinguished by the several streams by which they are drained all, with one exception, feeders of the Boolay river.

1.	Kyeenee Choung	Rising in the hills immediately beyond the Frontier and flowing Southwest, they with one exception join the Boolay in the plains.
2	Sassowa Choung ...	
3.	Bangoong Choung ...	
4.	Choungoungyee	Both constitute the sources of the Boolay and drain the slopes of the Pegu Yomah; the former flowing from East and Northeast and the latter from the Southeast.
5.	Pudday	

71. The hills in the first three blocks are extremely dry. Immense areas have been brought under *toungya* cultivation from the line of frontier Southward, owing to the constant influx of squatters from Upper Burma.

72. An examination of all these localities was made by Assistant Conservator, Moung Pho O, but with no other results than the discovery of two or three small blocks of Forest worth reservation. Although considerably isolated, their demarcation as reserved tracts appears necessary from the abundance of Cutch, Pynkadoe and other valuable trees in them, besides teak of which the following estimate has been made based on valuation surveys held over 562·2 acres :—

Kyeenee Choung—Average for 100 acres

I.	Class 6 feet girth and above	.. 25
II.	Class between 4′ 6″ and 6″ girth	24
III.	Class between 1″ 6″ and 4′ 6″ girth	89
IV.	Class below 1′ 6″ in girth	180

or a total of only 138 trees of first three classes on 100 acres. This low estimate testifies fully to the havoc which *toungya* cultivation has made in this locality. Cutch, chiefly of young growth, is however abundant, and with a view to prevent its extinction, it appears advisable to reserve a block of considerable area between the Sassowa choung on the West its feeders the Sadwing-myoung and Yaboke-choung to the North and South, and the Kyouklat range on the East, where the character of the Forest is best, and where the valuation surveys give as high an average as 609 teak trees of first three classes on 100 acres.

73. *Sassowa-choung.* Average for 100 acres.

I.	Class	23
II.	Class	26
III.	Class	200
IV.	Class	468

This gives an average of only 249 trees of first three classes on 100 acres.

Bangoong Choung. Average for 100 acres.

I.	Class	52
II.	Class	173
III.	Class	342
IV.	Class	617

Total of first three classes on 100 acres 567.

74. The only portion of the Bangoong district which has to some extent escaped *toungya* cultivation is very high up on the Kareenma-choung and the crests of the hills on either side of the Chit-tha-choung. Valuation surveys over an area of 83·706 acres gave an average of 824 trees (teak) of first three classes on 100 acres.

These tracts abound also in cutch (*acacia catechu*), Theyah (*Shorea obtusa*), Kokoh (*Albizzia Lebbeck*); Padouk (*Pterocarpus dalbergioides*) is scarce.

75. *Choungoungyee.* Every part of this district, even to the very crest and slopes of the Yomah, was carefully and systematically examined by Assistant Conservator, Moung Poh O. From his valuation surveys, it will be possible to arrive at a very correct estimate of the resources of this large and important district as soon as the topographical map now in course of compilation is completed.

76. The richest and most extensive teak localities are on the Benhoon choung—the Shwèloung East watershed the Yealoung East watershed and the tract between the Kyane and Shoukpen choungs.

77. In the first of these, the Benhoon sub-district and Shwèloung East watershed, the hightest average obtained was 896 trees of first three classes to the 100 acres, and the number of first class trees to the square mile 1079.

78. The valuation surveys on the range, East of the Yealoung bear out the estimate formed of the richness of this part in Annual Report for 1869-70. The highest average was obtained at the source of the Poukoh choung along the slopes of the Gwaypouk-ben-kior, viz 738 trees of first three classes to the 100 acres and 2,055 trees first class to the square mile.

79. The average obtained in the Kyane and Shoukpen choung tract was,

Highest average for first three classes on 100 acres	654
Lowest ditto ditto ditto	104
Maximum of first class trees to square mile	1,114

As noted in Adminstration report for 1869-70, paragraph 51, many portions of the higher hills in the Choungoungyee bear traces of *toungya* cultivation, and there can be no doubt that, but for this, the teak localities here would have been the finest in Pegu.

80. Besides teak, the Choungoungyee district abounds in Padouk (*Pterocarpus dalbergoides*), Kokoh (*Albizzia Lebbeck*), Cutch (*Accacia Catechu*), and Theyah (*Shorea obtusa*). The entire district East of the Yealoung choung will fall within the Yomah block, and thus protection against *toungya* cultivation will be extended to many valuable varieties of timber, all fast disappearing under the united efforts of wood-cutters and *toungya* cultivators.

81. *Pudday.* The results of the examination of this district confirm the information, already in possession of the Department, to the effect that the teak localities are of a very limited area and confined to the steeper hills at the very head waters of the Pudday river. The principal tracts are at the sources of the Neepardoung and Seingalay choungs, feeders of the Allay choung, on the North, and on either side of the Koonthee and Simmeedoo myoungs on the South.

82. That teak once existed in abundance throughout the Pudday valley there can be no doubt; small groups of young trees, and solitary trees, first class, here and there, together with remains of stumps in abandoned *toungyas*, all prove this.

83. The hills are moreover very low, and the level ground extends so far in towards the Yomah as to render the upper part of the valley more ac-

cessible to settlers than elsewhere. Its accessibility has led to the selection of a spur between the Pudday and Allay choungs as the line of ascent up the Yomah, for the Military road projected between Thayetmyo and Toungoo.

84. Valuation surveys over an area of 65·3 acres on the Neepardoung and Seingalay choungs the Koonthee and Simineedoo myoungs, gave the following results calculated for 100 acres.

I.	Class	148
II.	Class	63
III.	Class	278
IV.	Class	516

The highest average obtained of first class trees to the square mile was 941.

85. Other varieties met with in the Pudday teak tracts are :—

Pyimmah	Htonkshau
Padouk	Chityah
Kokoh	Deedoo
Yindike	Kyahthay

86. *North Nawing district.* A full report of the results of the examination of this district has not yet come to hand.

87. The Teak producing area has of late years, considerably diminished under the the inroads of *toungya* cultivation. The only valuable tracts, except the Shooaylaydoo a little to the West, representing in fact the only well wooded portions of the district are confined to the very head waters of the North Nawing stream and its upper tributaries.

88. Valuation surveys by Messrs. Stratford and Hough over an area of 345 acres, in the upper part, gave the following results culculated for 100 acres :—

I.	Class	599
II.	Class	432
III.	Class	605
IV.	Class	809
	Total of three first classes to 100 acres	1,636
	Average of first class trees to the square mile.	3,737

All the upper localities will be included within the block proposed for demarcation contiguous to the Yomah.

89. The following valuable varieties are found in them : Cutch (*Acacia Catechu*), Padouk (*Pterocarpus dalbergioides*) Pynkadoe (*Xylia dolabriformis.*)

90. The following are the results of valuation surveys held by Mr. Hough in the Gnamoizin tract to the West in which it appears desirable to demarcate a small area for the protection of cutch as well as teak against *toungya* cultivation :—

Average of teak for 100 acres.		
I.	Class	273
II.	Class	182
III.	Class	190
IV.	Class	108
	Total of 1st three classes	645
	Total of first class trees to the square mile	1,752

91. *Tsoonchoung district.* The most valuable of the teak tracts now left more or less intact by *toungya* cultivation, are those on the Nubbairbyoo and its feeders, and along the crest and slopes of the Tsa-yea-kior the Khyoungzouk North watershed range. Every portion of this district was examined by Messrs. Stratford and Hough, and large areas on the East and North side found to have been much injured by *toungya* cultivation.

92. Valuation surveys over an area of 397 acres in the Nubbairbyoo and along the Tsa-yea-kior, gave the following average of teak on 100 acres :—

I.	Class	412
II.	Class	208
III.	Class	328
IV.	Class	1,784
	Total of first three classes on 100 acres	948
	Total of first class trees on the square mile.	1,675

93. In these tracts it has been possible to make the following estimate of other valuable trees on 100 acres :—

Cutch on 100 acres	497
Padouk on 100 acres	40

94. *Middle Nawiny district.* From a careful examination of every part of this district by Mr. Aylmer, it appears that a large area in the Northern part has hitherto escaped the ravages of *toungya* cultivation, although the work of encroachment on the original Forest has been progressing very rapidly in the Oolairzway sub-district and along the banks of the main river.

95. The principal tracts which need demarcation are situated between the Oolairzway, Pooaygyen, Shooayloung and Dabee choungs and on the Bangway choung. Valuation surveys over a total area of 1360·7 acres in these tracts gave the following results calculated for 100 acres :—

Teak.

I.	Class	259
II.	Class	112
III.	Class	244
IV.	Class	645
	Cutch	124
	Padouk	19
	Pynkadoo	199

96. Valuable teak localities extend up to the Yomah, but are confined chiefly to the crests of the higher ranges, many of the entire valleys throughout their entire length having been brought under *toungya* cultivation by the Karens. These tracts will fall within the Yomah block and will consequently be protected by *toungya* cultivation being restricted within certain distinct and well defined areas.

97. In the lower portion of this district, on the South side, although the whole country has been brought under *toungya* cultivation, young Cutch is springing up in such abundance as to warrant the demarcation of one or more blocks for the special protection of that valuable species.

98. *South Nawing.* Valuation surveys held by Mr. Buchanan in the lower or Western portion of this district over a total area of 279 acres gave the following results calculated for 100 acres :—

Teak.

I.	Class	33
II.	Class	102
III.	Class	193
IV.	Class	687
	Cutch	1,092

Padouk appeared very scarce being limited to the Pengwa, Palangway, and Kyat-Myoung tracts, the highest average obtained was, in the Pengwa, viz., 42 trees to the 100 acres. Kokoh (*Albizzia Lebbeck*) was met with near the Shaudoung-Myoung, but only in the proportion of 10 trees to the 100 acres. As both these varieties are becoming more and more scarce, the reservation of the above mentioned tracts in whole or part appears very necessary.

99. The examination of the Upper part of the South Nawing valley up to the Yomah was affected by Assistant Conservator Moung Poh O, somewhat late in the season. Large areas in the vicinity of the Yomah were found much injured by *toungya* cultivation, several temporary villages having sprung up in this part within the last few years.

100. The actual area of the richer teak tracts abounding in mature timber is much less than what has been estimated hitherto, but doubtles many portions will recover the effects of *toungya* cultivation after a considerable lapse of time, cultivation in the mean time being restricted to well defined blocks as will be done elsewhere contiguous to the Yomah.

101. From valuation surveys over an area of 570·9 acres, the average number of teak trees on 100 acres was found to be :

I.	Class	97
II.	Class	34
III.	Class	79
IV.	Class	79
	or of first three classes	211
	The maximum number of first class trees to the square mile was	623

Of other valuable trees, Padouk *(Pterocarpus dalbergioides)*, Cutch *(Acacia catechu)* Pynkadoe *(Xylia dolabriformis)*, were noted.

102. In the Bamboong Sub-district drained by the Bamboong a large affluent of the South Nawing stream, the principal teak localities were found by Forest Ranger, Moung Way, to be limited to the crests and higher parts of the hills and the Shwèlay North watershed, the intermediate area and along the streams having been more or less brought under *toungya* cultivation. Many of the teak localities vie, however, in richness with the finest in the Province. The highest average obtained of first three classes on 100 acres was 2043 and of first class trees to the square mile 1877.

103. There is an abundance also of other valuable trees in the Bamboong, as proved by the following figures representing the average number of trees on 100 acres :—

Cutch (*Acacia Catechu.*)	1117
Padouk (*Pterocarpus dalbergioides.*)	5
Pynkadoe (*Xylia dolabriformis.*)	257
Engyin (*Hopea suava.*)	174
Eng (*Dipterocarpus tuberculatus.*)	12
Thitpyoo (*Lagerstræmia sp :.*)	63

104. The Meeloung, the most Westerly of the South Nawing sub-districts, was also examined by Forest Ranger, Moung Way, chiefly with the view of selecting tracts for demarcation as Cutch reserves, this valuable tree having formerly covered large areas here.

Valuation surveys over an area of 787·6 acres gave the following results calculated for 100 acres :—

Teak.

I.	Class	113
II.	Class	177
III.	Class	729
IV.	Class	1345
	Cutch of all sizes	129
	Pynkadoe ditto	275
	Engyin ditto	366

105. Although almost every part Westward has been brought under *toungya* cultivation, it appears advisable to demarcate a limited area in that part, young Cutch trees being very abundant.

106. *Mahathaman district.*—This is the Southernmost of the districts contiguous to the plains in the Prome division It embraces a block of hills of considerable altitude representing the watershed between the South Nawing stream on the North, the Shwèlay on the East, and the Letkyoe and Zalookma streams on the West which flow Westward through the Eng Forest and ultimately drain into the Engmah lake to the South East of Prome.

Teak of of superb growth formerly covered these hills in great profusion as proved by the abundance of large stumps and young trees of excellent proportions. Only in the steeper parts of the range a few isolated portions of the original Forest have escaped *toungya* cultivation, and here 1st class trees of excellent growth are still to be found. Elsewhere the Forest comprises chiefly young trees (teak and other varieties) and bamboo jungle of various ages as usually met with on land, brought under *toungya* cultivation.

107. Valuation surveys in every part by Forest Ranger, Moung Way, over a total area of 1915·5 acres, gave the following results calculated for 100 acres :—

Teak.

I. Class	27
II. Class	70
III. Class	510
IV. Class	512
Total of teak on 100 Acres	607
Do. Cutch (*Acacia Catechu*)	165
Do. Pynkadoe (*Xylia dolabriformis*)	418
Do. Engyin (*Hopea suava*)	403
Do Kokoh (*Albizzia Lebbeck*)	5
Do. Eng (*Dipterocarpus tuberculatus*)	2274
Thitpyoo (*Lagerstrœmia sp.*)	3

However desirable it may be, it will be possible only to select a limited area here for demarcation owing to the existence of several villages in the vicinity the people of which subsist largely by *toungya* cultivation,

Rangoon Division.

108. No special examination of any district was possible except such as was necessary in connection with girdling operations in the Pounglin and Baunee districts.

109. *Pounglin district.* The Forests in this district were noted in Annual Administration report for 1864-65 as being very poor. The result of this past season's examination of only a part of the district shew, however, that it contains a considerable quantity of of mature teak timber. Out of 2,368 trees, first class, met with, 2,000 were selected for girdling.

110. Surveys over an area of 113.6 acres by Mr. N. Daly gave the following average on 100 acres :—

I. Class	124
II. Class	413
III. Class	596
IV. Class	2086
or a total of first three classes	1133

111. *Baunee district.* This comprises the Yainway, Binedah and Kawleyah tracts. Surveys held in the Kawleyah, over an area of 225·8 acres, by Mr. Daly gave the following results calculated for 100 acres :—

I. Class	73
II. Class	222
III. Class	545
IV Class	1011
or a total of first three classes	840

Upwards of 4,771 trees, first class, were counted in the course of girdling operations, and it is believed more are to be met with. The growth of the tree in the lower tracts is not very good.

Salween Division.

112. *Attaran district: Mittigate Sub-district.* An examination was made of this district by the Conservator in connection chiefly with the question of the natural re-production of teak and the liability of the Lease holders to supplement re-production by artificial means.

113. Valuation surveys over an area of 59·79 acres gave the following results calculated for 100 acres :—

I.	Class	21
II.	Class	11
III.	Class	51
IV.	Class	76

This gives an average of 486 trees, fourth class, to the square mile, and precludes the enforcement of the planting clause.

(e). Plantations.

114. In accordance with the instructions of the Local Government conveyed in letter No. 662-23 F of 5th November 1870, operations in connection with teak plantations have been chiefly concentrated in the Rangoon division. The Local Government having also sanctioned the continuance of the work in other divisions, provided no expenditure was incurred beyond the payment of taxes due by the cultivators and cost of teak seed, a small area has been taken up in extension of the Pyoon-choung plantation, Sittang Division, under these terms.

Rangoon Division.

115. *Kyekpyoogan Plantation of 1871 ; 356 acres.* Two blocks comprising a total area of 368 acres have been taken up to the South and North-West respectively, in extension of the Kyekpyoogan plantation.

The distribution of this area is as follows :—

	Acres.
Made over to Shan and Burmese cultivators @ Rs. 10 per acre	92
By cooly labor on monthly and daily wages	264
Reserved for paths and roads	12
Total Area ...	368

The operations of the year, therefore, embrace an actual extension of 356 acres.

116. Up to date the following progress has to be recorded :—

The process of felling (including even the largest trees), lopping and burning was satisfactorily accomplished before the rains set in. Roads running parallel to each other and dividing the plantation into regular blocks of uniform size were then marked off and cleared of *debris,* nurseries were formed, and the entire area planted as follows :—

	Acres.
Planted out with teak transplants at 6′ × 6′ distances, 105 acres, South end ; 42 acres North end	147
Sown with forced teak seed, 2 to each peg (North end)	117
Total ...	264

117. Experimental cultivation of other crops along with teak has also been undertaken on the above area, viz :—

		Acres.
Sown with Cotton		247
Planted out with Chillies		10
Ditto	Ginger	2
Ditto	Yams	4
Ditto	English potatoes	1
		264
Planted out with teak at 6′ × 6′ distances and various crops by hired cultivators		92

118. *Buildings, drains and Bridges.* A teak bungalow with shingle roof 40′ × 40′ in size as Officer's quarters, was completed at the close of 1870. Temporary quarters were also erected for between 200 and 300 coolies. It has been found necessary to dig three large drains in the Southern part of the plantation and erect several temporary bridges over the ravines there.

119. *Labor.* The hired cultivators employed last year struck work in December, and demanded as high as Rs. 20 per acre for work done in future. This was refused on the ground that further concessions would be eventually asked, which would raise the cost, per acre, to that incurred under the *direct* labor system.

120. Ultimately 46 Burmese and Shan cultivators, mostly new hands, were engaged, but only for one year ; their areas in all 92 acres, will have to be made over to the Department at the close of the year. This alteration was necessitated by last year's experience, shewing that the cultivators are so occupied with the new areas, as to be able to devote little time towards weeding and keeping clear their areas of the previous season, which was the plan first introduced.

121. An establishment of Madras coolies on Rs. 12 per mensem pay, has been maintained, varying at times from 100 to over 400 hands according to the emergent nature of the work to be performed.

122. *Control and protection.* The plantation has continued under the control and able management of Mr. C. F. Nepean, Assistant Conservator of Forests 3rd grade.

The strength of the Plantation establishment has been :—

1.	European Overseer on	Rs. 90	Rs. 203
1.	Overseer	„ 30	
1.	Burmese writer	„ 15	
2.	Goungs @ 10/ { *over hired cultivators.* }	„ 20	
4.	Peons @ 12/	„ 48	

123. *Cost.* It is not possible at this early stage of the work to estimate the exact cost. The large area under the direct system of cultivation together with the making of roads, bridges, drains, &c., to facilitate access in every part, will considerably swell the cost of actual cultivation.

124. *Plantation of 1870. Area 147·25 acres.* This plantation received a complete weeding by the beginning of July. The greater portion is thoroughly stocked with teak plants nearly all of which indicate vigorous growth. The height of the plants varies considerably in proportion to the greater care bestowed by the hired cultivators in keeping their areas free from grass, &c., last rains.

125. *Experimental cultivation.* Over the entire area of this plantation, *toorie* has been sown broadcast, with a view to suppress futher growth of jungle and reduce the cost of weeding.

126. *Cost of plantation.* The total expenditure incurred in the formation of this plantation in 1870-71, amounts to Rs, 4,628-10, inclusive of the whole of establishment charges, Rs. 1,541-10; hire of cultivators including taxes, Rupees 1,571-14; tools, Rs. 268-6; survey charges, Rs. 103; temporary buildings &c., Rs. 339-2.

The average cost per acre is about Rs. 31.

127. *Cost of experimental cultivation of 1870-71.* The expenditure incurred in the cultivatoin of the sweet potatoe over 22½ acres of 1868 plantation, 36 acres of 1869 plantation, and 1½ acres of 1870 plantation, or a total area of 60 acres, amounted to Rs. 1,721-1, or Rs. 28 per acre.

128. The yield obtained on the 1½ acres of 1870, was 4·375 tons of sweet potatoes or at the rate of 2·9 tons per acre. On the other areas, owing doubtless, to the soil having been impoverished by the cultivation of the previous year, the partial shade of the teak plants, and the theft of a portion of the produce at night, the yield was considerably less; viz. 18·02 tons.

129. The total yield viz., 22·4 tons of sweet potatoes realized Rs. 1,294-2, or Rs. 21-8 per acre. This difference, between outlay and return of Rs. 6-8 per acre is amply compensated for by the saving under the head of weeding which these 60 acres would under any circumstances have required during the year and by the beneficial effects, this more elaborate system of cultivation has had upon the teak plants, which quite surpass those in other parts.

130. *Cotton and Chillies.* The results of minor experiments with Cotton and Chillies over 9 acres involved an expenditure of Rs. 78-4. The crops realized only Rs. 22-8, or Rs. 2-8 per acre. The difference in outlay and return, Rs. 6-3 per acre, may be taken as representing the reduced cost of weeding, which the teak plants would in any case have required.

These experiments have not, it is true, secured any profit to the department, but taken as a beginning, their results may be considered satisfactory. Much valuable experience has been gained by them, and doubtless if persevered in, more encouraging results will be obtained,

131. *Plantation of 1869; 145 acres.* It was with difficulty the Shan cultivators could be induced to keep their allotments in this plantation, thoroughly clear of weeds during last rains. Some portions have consequently suffered and exhibit a slower rate of growth than those in other parts. The contrast is greatest in comparison with the 36 acres cultivated with sweet potatoe where the teak plants, originally somewhat behind-hand in growth, have quite recovered themselves.

132. The system of entrusting the hired cultivators with the care of their previous season's areas has been discontinued.

133. The whole area of this plantation is now in course of being thoroughly weeded; six acres have been also sown with *toorie.*

134. *Expenditure of 1869 Plantation.* The total amount expended on this plantation was Rs. 2,755-14 inclusive of share of capitation taxes of cultivators, but exclusive of experimental cultivation charges.

135. *Plantation of 1868; 35 acres.* The effects of the conflagration recorded in paragraph 74 of Administration Report for 1869-70 have been such as to necessitate the *stumping* or cutting back, of several thousand plants which

otherwise could not have developed straight, sound stems. The plants thus treated last rains have thrown up powerful suckers from 8 to 13 feet in height.

136. *Experimental Cultivation.* Pines were put out along the outer edge of this plantation ; they do not indicate good growth, and many have died down.

137. *Growth of Plantation 1868.* Measurements taken in June 1871, gave the following results :—

76 trees taken in regular order in lower part near the road :—

	Girth at 6 feet.	Height.
Maximum.....	8″	20½′
Minimum.....	2″	6¼′
Average	4¼″	13¼′

64 trees in regular order in upper part of plantation :—

	Girth at 6 feet.	Height.
Maximum.....	7⅝″	20½′
Minimum.....	3¼″	9¼′
Average	5½″	14¾′

The mean of both measurements is, girth—4 & 7/8 inches; height—14 feet. The growth of this plantation may be considered satisfactory up to the present.

138. *Pruning operations.* Arrangements have been made for a careful pruning of the entire plantation.

139. *Expenditure.* A sum of Rs. 520-15 has been expended during the year on this plantation.

140. *Total Expenditure in 1870-71.* The total expenditure at Kyekpyoogan during the past year may be thus apportioned :—

	RS. A.
Against Plantation 1868-69 (40 acres)... ...	520-15
Do. 1869-70 (145 „)... ...	2,755-14
Do. 1870-71 (147.25 „)... ...	4,628-10
Experimental cultivation in 1870-71	2,060- 0
Towards commencement of Plantation of 1871-72...	1,691- 8
Total.....	11,659-15

141. In addition to the experimental cultivation of sweet potatoe &c., already noted, a large coffee nursery was formed during the past year : this tended to swell the expenditure under that head.

142. During the year, a system of carefully checking and noting plantation expenditure against each year's block, has been introduced at Kyekpyoogan.

THARRAWADDIE DIVISION.

143. No additional area has been brought under cultivation in this Division.

144. *Choungwah plantation of 1870. Area 70 acres.* In Forest Administion report for 1869-70, the expenditure incurred up to July 1871 was noted at Rs. 32 per acre, inclusive of Native Assistant's pay. Subsequently further clearings took place involving an additional expenditure of Rs. 9-6 per acre, inclusive of Goung's pay, making a total expenditure of Rs. 41-6 per acre.

145. *Experimental cultivation.* A crop of 635 viss of cotton was obtained off this plantation. Instead of having it disposed of on the spot, and thereby

recovering expenditure involved, the Divisional officer had the entire crop picked by daily labor and taken for sale to Myanoung, incurring thereby, additional expenditnre to the extent of Rs. 111-7. The amount realized there was only Rs. 88-14-9.

That the teak plants benefitted by the shade afforded by the cotton plants, there can be no doubt of, but this advantage would have been obtained at far less cost, if the plan of selling the crop, as it stood, had been adopted, especially as, in the early part of the season, high prices were prevailing.

146. *Choungwah of 1868; Area 185 acres, 25 Poles.* This plantation was cleared a second time in October, at a cost of Rs. 160, including Goung's pay for one month.

147. The Conservator in company with the Divisional officer inspected this plantation in March last, and took measurements in the best part. The results were :—

	Height.	Girth at 5 ft.
Maximum	24 ft.	8½ in.
Minimum	6 ft 2½ in.	not taken.
Mean	16¼ ft.	6·7 in.

148. *Choungwah of 1866 ; Area 85 acres, 10 Poles.* Seventeen trees were also measured in this plantation with the following results :—

	Height.	Girth at 5 ft.
Maximum	36¼ ft.	16⅓ in.
Minimum...	20 ft.	8½ in.
Mean...	30½ ft.	12⅔ in.

149. *Fire in Plantations of 1866 and 1868.* The Divisional Officer reported the entrance of fire into this plantation and that of 1868, at the very close of the dry season. As every precaution had been taken to keep the fire path on the land side clear, and as the fire entered from the side of the Thayetchoung, it is believed to have been the work of an incendiary. The circumstance was reported to the Police, but up to date, nothing has come to light.

The injury is estimated by the Divisional Officer to be very slight in the case of the older trees ; while with those of 1868, it has resulted in numerous fresh shoots taking the place of those burnt down.

150. *Effects of conflagration.* Experience, however, of the effects of conflagrations in the Kannee plantation, Sittang division, and the Kyekpyoogan plantation, Rangoon division, is most conclusive as to injury by fire being the primary cause of bad growth in teak—such as development of forked, crooked, and stunted stems.

The only remedy is to stump every injured tree level with the ground, and thus permit vigorous suckers to come up in the room of the former stems which, if once checked in growth *at the crown,* can never develope into good timber trees.

151. A careful examination will be made of both these plantations with a view to treating all injured trees in this way ; and as the growth of suckers is very rapid, 8 to 10 feet in first season, these plantations will speedily recover.

152. *Queaymakeing plantation of 1869. Area 86 acres.* This plantation was weeded in August, at a cost of Rs. 449-8. It was inspected by the Conservator in March. The measurements of 29 trees taken at random, gave the following results :—

	Height.
Maximum	15 ft. 10 in.
Minimum	..... 9 in.
Mean	5 ft. 3 in.

153. *Plantation of toungya cultivators.* Owing to want of supervision the results of the work of planting teak on the part of cultivators, in Reserved tracts, have not been satisfactory.

The areas are as follows :—

Mokkha	12 acres	failures 75 o/o
Thitcho	8 do	do „

It appears advisable to suspend further work of this nature, unless it can be concentrated in one Reserved tract easy of access throughout the rains.

SITTANG DIVISION.

154. *Pyoon-choung, Thoukyaghat, of 1870. Area 296 acres* On the portion cleared and planted under direct Departmental agency, viz., 196 acres, sesamum was first cultivated ; and then later in the season, cotton was raised between the rows of teak standing at 10′ × 6′ distances.

155. To the rocky and undulating nature of the ground as well as to the short rain-fall of the year, Mr. Graham ascribes the indifferent results obtained, viz :—

Teak—failure 25 per cent average on the acre ..		544 trees
Total expenditure Rs. 21-9 per acre		Rs 4,237
Deduct		
Amount realized on 150 baskets of sesamum sold, ...	Rs 450	
Amount likely to be realized for remaining sesamum and cotton ..	„ 250	
		700
		Rs 3,537
Expenditure per acre	Rs 18-0-8	

156 The clearings undertaken by the Shan cultivators (100 acres), exhibit 30 per cent failures among the teak plants.

157. The total expenditure over the entire 296 acres gives an average expenditure of Rs. 15 per acre

158. *Plantation of 1869. Area 184 acres, 12 roods, 7 poles.* The cost of this plantation as noted in Forest Administration report for 1869-70, was estimated at Rs. 22-8 per acre over the 92 acres planted by direct labor. A sum of Rs. 350 was subsequently realized on the cotton crops which reduced the cost to Rs 18-11-3 per acre.

159. During the past year this plantation has been kept clear and protected at a cost of Rs. 1,344-10-2,

160. *Plantation of 1868. Area 120 acres.* This plantation has been cleared and 16,000 pines have been set out. The plantain trees put down last year have yielded a small return Rs. 8-8. As these trees require rich, moist soil, they will not do well throughout a plantation ; and Mr. Graham is not in favor of setting out any more, although there can be no doubt that the teak plants thrive in their company.

161. The expenditure incurred amounted to Rs. 886-4.

162. *Plantation of 1867. Area 44 acres.* 5,000 more pines have been planted out under the teak trees ; a small return was received by sale of pines viz., Rs. 10, but the receipts anticipated for the current year will be much higher.

163. Expenditure amounted to Rs. 200.

Prome Division.

164 *Plantation of 1856. Area 22 acres.* The work was confined to the cutting of creepers and exclusion of fires.

165. The results of the annual measurement of the 47 trees selected for that purpose (formerly 50 in number,) exhibit an average increase between November 1869 and November 1870, of 1·35 inch per tree. The trees are thriving and in healthy condition , in places thinning appears necessary.

166. *Plantation of 1867 and 1868. Area 44 acres 2 poles.* Mr. Elsner reports that this plantation received a severe check by the prolonged drought in the latter part of 1870 ; many of the seedlings have died down making the total failures exceed 50 per cent The surviving plants are, however, very healthy ; and as fires were entirely excluded, this plantation will quite recover during the present rains.

Sittang Division.

167. *Cinchona plantation.* Experiments were made at Than-Toungyee with a fresh supply of seed (*succirubra*), from Ootacamund, towards the latter part of 1870 The results were not satisfactory, the trained Native Assistant ascribing this to the age and inferior quality of the seed obtained. The number of seedlings raised was only 60.

168. Two additional parcels of seed, *succirubra* variety, were obtained from Ootacamund and Darjeeling respectively : that from the latter place is reported as being good and germinating freely.

300 seedlings had been raised according to latest reports and fresh ones were coming up daily, and as the trees at the Bogelay and Plumadoe sites have commenced to flower, there will be no difficulty in future in procuring good seed.

169. *Propagation by cuttings.* The 300 cuttings raised last rains at Plumadoe were removed to the Than-Toungyee site, and placed under hardening frames preparatory to being put out in the open plantation this rains. Some failures occurred, but as the work of propagation was continued, the number of cuttings fairly established amounts to 563 in all ; according to latest report received, 500 of these had been successfully planted out in the main plantation.

170. This locality was examined late in the dry season by Mr. Kurz, Curator of the Herbarium, Royal Botanic gardens, Calcutta. He pronounces the vegetation at Than-Toungyee, to be of the evergreen order belonging to the Upper dry Forests, and the soil to be a decomposition of Felspar of granite rocks, with a large admixture of coarse quartz. In his opinion the locality is not sufficiently moist enough for a sucessful cultivation of Cinchona, but is a first rate site for tea , a species of camillia probably indentical with the Assam tea plant, being found in great abundance here.

171. Experiments have been made with Eucalyptus seed ; sixteen plants came up and are doing well,

172. *Plumadoe of December 1868.* The Cinchona trees now in existence are as follows .—

88 in upper site (one overlooked last year)
46 in lower site.

13 failures occured during the year or 22 per cent of the trees in the lower site The cause in every instance, is attributed by Mr. Graham, to the roots being attacked by a species of grub (termed *kiddeekoo* by the Karens), which is most destructive to the paddy crops on the hills, and must have been attracted to the plantation by the paddy cultivated in the vicinity.

173. Although the remaining trees are all healthy and indicate rapid growth, as shewn below, yet it is evident a few more failures may yet occur until the plants are old enough to resist the attacks of this insect.

Five of the trees are now in flower.

		Height
134 trees	Maximum	10 ft 3 in.
	Minimum	1 ft 2 in
	Mean	5 ft 10 in

The fact of the failures being confined entirely to the Lower site selected by Mr. Kurz in 1868, where the plants also are not near so vigorous as those on the Upper site, suggests that this site is perhaps too low and moist for the Cinchona plant.

174. *Bogelay site.* The two plants put out here in 1866, have been regularly watered during the past dry season; one of them is now in flower.

	Height.	Girth 3 ft from ground.	No of branches.
No 1	9 ft. 4 in.	8½ in	32
No 2	10 ft. in	7 in	28

175. *Establishment.* No alterations have taken place in the Cinchona plantation establishment which consists of one trained Assistant and four lads under instruction, one Goung also, and one Peon.

176. *Expenditure.* The total expenditure incurred during the year on propagation, preparation of main plantation, establishment, &c., amounted to Rs. 2,311-2.

177. The Conservator has been in communication with Mr. J. Broughton, Government Quinologist, Ootacamund, with reference to the easiest method of preparing the bark as a febrifuge. Mr. Broughton is of opinion that the preparation of amorphous quinine would be the most suitable, but as this would require the services of an intelligent apothecary, an acid extract of the bark is all that could be attempted by natives in this country.

178. Some dried specimens of a suspected Cinchona plant, indigenous in the hills East of Toungoo, were pronounced by Mr. Broughton to be the *Hymenodictya excelsum* noted in Balfour's timber trees of India as *Cinchona excelsum.*

5.—Yield and working of the Forests.

179. During the year the outturn from the Forests of the Pegu and Tenasserim divisions is as follows :—

			Logs.	Tons.
*Logs Sleepers	19,837 2,712 22 549	Brought to Depôts by Contractors in the Tharrawaddie and Rangoon divisions	*22,549	19,398 4
		Obtained from the Seashore, Drift, and Miscellaneous sources	3,581	3,367
		Worked out by Permit holders	46,380	34,321 2
		Total .	72,510	57,086 6

180 It will be apparent that the out turn is even greater than that of 1868-69, which was considered very high. The greatest increase, however, is under timber brought out by permit holders, while from the Government Forests, the increase is over 9,000 tons.

181. The quantity of neaped timber this season is also considerable, and there is every reason to suppose that the outturn of next season will amount to more than an average yield.

182. *Sleepers.* It will be observed that although enhanced rates were offered last season, the numerical outturn is considerably less than 1869-70. As this branch of operations pre-supposes a recompense of outlay only, and there is no inducement to expand the work, it does not appear necessary for Government to undertake the work on a large scale, except when necessary for the supply of Public Departments. At present the work has been suspended pending receipt of definite information relative to the construction of the Prome Railway and sizes of sleepers required.

183. *Departmental Elephants.* At the close of 1869-70 the Department possessed..... ....

		Elephants.
		86
Number added during the year by purchase and confiscation from Contractors:		
For Depôt and carriage purposes...	15	
Do. Loan to Contractors...	31	
	—	46
	Total...	132
Paid for by Contractors...	4	
Casualties...	14	
Sold	2	
Lost at Prome	1	
	—	21
Balance on 31st March 1871.....		111

This high percentage of casualties was occasioned by a severe epidemic breaking out in the Sittang division, as noted in para 134 of Administration Report for 1869-70.

184. During the year a sum of Rs. 10,123-5 has been received and credited to Miscellaneous receipts, being payments made by contractors towards adjustment of purchase money of elephants loaned to them by the Department. The total amount of interest realized during the year on elephants loaned to contractors was Rs. 2,556.

185. In the Sittang division 239 elephants are at work. The permit holders lost 22 by death or somewhat over 9 per cent shewing a heavier rate of mortality than 1869-70. The number of animals employed has more than doubled since 1868-69.

186. *Permit system.* There has been an increased outturn from all the divisions in the following proportion :—

Irrawaddie division	Logs.
Prome and Rangoon	1,061
Sittang division	7,238
Salween do.	6,064
Total...	14,363

A large proportion of the increase in the Sitting division is of course due to the bringing out of the timber neaped last season, and mentioned in paragraph 138. In the Salween division the increase is due to a favorable outturn from the Upper Salween, Thoungyeen, and Attaran tracts.

187. With the sanction of Government a new system of assessing permit timber on the running foot principle, involving a considerable increase in the rates, has been introduced in all Forests for which fresh permits were issued during the year.

SECTION IV.

YIELD OF THE FORESTS BEYOND THE FRONTIER AND MANAGEMENT OF THE KADOE TIMBER REVENUE STATION.

188. The following timber was imported during the year :—

		Logs.	Converted pieces.
Salween.	Foreign .. 73,169	92,007	
	British . 18,838		
	Irrawaddie	2,703	... 14,687
	Sittang	9,944	... 1,441
	Total ..	1,04 654	16,128

These figures exhibit a decided increase over that of 1869-70, and almost equal the quantity imported in 1868-69.

189. The importation by the Sittang and Irrawaddie route continues to be small · considering the difficulties to which the timber imported by the Salween route is subjected, the quantity brought down during the year is very satisfactory.

190. There was an increase in the outturn of all the Forests, except the Thoungyeen. The working out of the timber along the Thoungyeen was attended with great difficulties owing to the presence of large bands of dacoits. The present resources of the Thoungyeen are, however, known to be very poor; and a falling off in the outturn must be expected.

191. It is of importance to keep the annual importation of Foreign timber in view; and the following is the record of timber brought in for the last four seasons by the Salween river :—

	Logs.
1867-68	68,221
1868-69	62,625
1869-70	44,262
1870-71	73,169

The number of logs cleared on payment of duty is 71,168, leaving a considerable balance of the present season's importation to pay duty in 1871-72.

192. The cash transactions of the year may be thus summarized —

Foreign.

	RS A P
Duty on Foreign timber	1,49,956- 9-0

Home or Forests

Duty on British timber	24,906- 4-0
Sale of confiscated, drift and waif timber	7,363-14-0
Miscellaneous	5,605- 7-0
Total ..	1,87,832- 2- 0

193. The following figures shew the expenditure of the year.

	RS A P
A Convervancy and working	8,271-12- 0
B Establishments	6,445-12- 0
Total ..	14,717- 8- 0

194. The net revenue, therefore, of the Kadoe station, excluding receipts under Home or Forests, is Rs. 1,35,239-1-0.

195. The working of the Kadoe Revenue station continues to be supervised and controlled by Mr. Slym, in addition to his other duties as Officer in charge of the Salween Division.

196. During the past year 214 Hammer marks were registered, 78 being new and 136 old marks. The sum paid was Rs. 2,140.

SECOND PART—GENERAL.

I. Financial Results.

197. *Receipts.* The cash receipts of the year amount to Rs. 8,18,124-4-0.

This Revenue was contributed by the several divisions in the following proportion :—

	RS.	A.	P.
Tharrawaddie and Rangoon	3,71,582-	4-	2
Prome	37,966-	2-	4
Sittang	1,47,753-	6-	6
Salween	72,990-	5-	0
Kadoe Revenue station...	1,87,832-	2-	0
Total ..	8,18,124-	4-	0

198. Against this, the following expenditure has to be charged :—

A. Conservancy and working	2,89,468-13-	1	
B. Establishments...	1,10,566-10-	8	
Allowances refunds and drawbacks.....	113-	6-	0
Total...	4,00,148-13-	9	
Exhibiting a cash surplus of	4,17,975-	6-	3

199. The Budget allotment for the year was,

Receipts...	7,45,000
Charges	4,15,418
Surplus...	3,29,582

Financially therefore, the Revenue of the Department may be considered satisfactory considering that the yield of the season has been large, no less than 22,765 tons. The expenditure of the year may be considered extremely moderate. The result of such a large outturn is that the stock in hand at the close of the year has been considerably enhanced.

200. The following comparative statement of Receipts and Expenditure will afford an accurate view of Divisional transactions.

Division.	Revenue.			Expenditure.			Surplus.			Deficit.		
Prome...	37,966	2	4	27,641	9	5	10,324	8	11	...	..	.
Tharrawaddi & Rangoon ..	3,71,582	4	2	3,10,927	10	0	60,654	10	2	...	.	.
Sittang	1,47,753	6	6	31,825	1	4	1,15,928	5	2	...	.	.
Salween...	72,990	5	0	14,923	11	0	58,066	10	0	...	...	...
Kadoe...	1,87,832	2	0	14,717	8	0	1,73,114	10	0	...	.	..
Total Rs ..	8,18,124	4	0	4,00,035	7	9	4,18,088	12	3	...	..	...

Deducting from this surplus the amount of allowances, refunds, and drawbacks of the year, Rs. 113-6-0, we have a net Revenue of the Department for 1870-71 as follows :—

	RS. A. P.
"Home" or Forests	2,82,736-5-3
"Kadoe" or Foreign	1,35,239-1-0
Total net Revenue in cash ..	4,17,975-6-3

201. To the above sum should be added the following items to show the actual amount to credit of the Department :—

	RS. A. P.
Value of timber sold by Public Auction not yet collected	2,736-0-0
Permit Revenue due on timber worked out of the Salween and Prome Division ...	45 000-8-0
Value of 25 Elephants in excess of 1869-70	12,500-0-0
Difference of value of Stocks of 1870-71 as compared with 1869-70...	1,12,335-0-0
Total of assets ..	1,72,571-8-0

The actual surplus, therefore, in favor of the year's operations, amounts to Rs. 5,90,546-14-3.

202. The actual cash transactions of the Department for the year may be thus recorded :—

Drawn.	RS. A P.
Cash drawn from State Treasuries	3,84,571-1-5
Other remittances .. ..: ...	771-7-7
Difference between Revenue realized and remitted to Treasuries	15,857-1-3
Difference between advances made and recovered	1,710-5-4
Ditto ditto receipts and repayments of Deposits...	2 186-7-7
Total...	4,95,096-7-2
Outlay.	
Expenditure of the Department	4,00,035-7-9
Remittances Divisional Offices	695-5-8
Allowances, Refunds and drawbacks ...	113-6-0
Cash Balance in favor the year	4,252-5-9
Total...	4,05,096-7-2

203. *Contractors' timber.* The total expenditure incurred on 23,418 logs and 2,712 sleepers is Rs. 3,28,022-10-0, exhibiting the cost per log at Rs. 12-2. The rate per ton is Rs. 14-5 ; taking into consideration that over 15,000 logs of the year's out-turn belonged to the best classes of timber (Loozars and Doogies) the rate cannot be assumed as high.

204. *Timber sold.* The total number of logs disposed of during the year was 14,207, and may be thus exhibited :—

Particulars.	Logs.	Amount realized.		
By Public Auction	10,240	2,62,573	...	...
On Indent by Public Works Department and Private Parties ... ... Logs ..	3,113	67,336	5	6
Sleepers .	150	300	...	...
Drift, confiscated and waif Timber	704	7,363	14	.
Total .	14,207	3,37,573	3	6

205. The average price realized per log was Rs. 23-12-2 and Rs. 22-5-7 per ton. Considering the fact that two-thirds of the timber sold consisted of Loozars and Doogies the average should have been higher. The net Revenue realized per log has been Rs. 11-2-2 or Rs. 8-0-7 per ton shewing a falling off in the rates realized during the last two years.

206. *Permit timber.* The out-turn from the different divisions may be thus shewn :—

	Log.
Prome East & West	11,676
Rangoon division...	395
Sittang	18,726
Salween...	15,583
Total ...	46,380

or 34,321·2 tons, the sum realized on this out-turn is Rs. 2,78,299-5-6

The following charges have to be debited to this account :—

	RS. P. A.
Prome East & West..	27,641- 9-5
Rangoon division	660- 0-0
Sittang	31,825- 1-4
Salween	14,923-11-0
Quota of direction	10,500- 0-0
Total ...	85,550- 5-9

207. The result is a profit of Rs. 4-3 per log and Rs. 5-10 per ton.

208. The following permits lapsed and were re-sold at the following prices :—

	Permit Fee. Rs.
Sittang Division.	
Myolha	8,000
Samoh...	5,000
Bimbyai...	5,000
Khaboung...	6,000
Swah	4,500
Youkthawah...	3,500
Kannee...	3,300
Padah...	2,600
Thoukyaghat...	2,000
Moong...	1,050
Salween Division.	
Hlineboay...	180
Attaran.	
Tracts 19, 20, and 21...	20
„ 3, and 33...	20
Prome Division.	
Shwèytangah, Thellaydan and Kawa... ... ... } *Annual Minimum Revenue*	2,100

II. GENERAL REMARKS.

209. *Inspection tours of Conservator.* The Conservator inspected the Kyekpyoogan teak plantation on the 7th August and the Prome and Myanoung Forest offices on the 13th and 16th September, respectively. The Kyekpyoogan plantation was again visited by the Conservator on 1st November, when

valuation surveys were held in the Forest to the South West for the instruction of Mr. A. M. Buchanan, Assistant Conservator 2nd grade, and Mr. A. L. Hough, Sub-Assistant Conservator.

210. On the 20th November the Conservator left Rangoon for Prome, and proceeding thence into the hills superintended the commencement of demarcation operations in the Tsoon-choung district under Messrs Stratford and Hough and in the Middle Nawing district under Mr. A. P. Aylmer, and returned *via* Poungday and Myanoung to Rangoon by the 22nd December.

211. Between the 12th and 29th January, the Conservator visited Maulmain and examined the Mittigate, Goongyee, and Nat-choung Forest tracts in the Attaran District.

212. On the 7th February the Conservator proceeded to Shoaygyeen and marching to the North as far as Kyoungbiar struck Eastward into the Padah district ; and after inspecting the girdling work then in progress, proceeded to Toungoo, arriving there on 18th February.

213. On the 20th and 23rd February the Pyoon-choung teak plantation and Than-Toungyee Cinchona plantation were respectively examined by the Conservator who after inspecting the Forest office Toungoo, proceeded towards the Prome district on the 27th February by the Choungmagnay, a feeder of the Khaboung river.

214. Crossing the Yomah at the watershed between the Kahboung and Swah districts, the Conservator entered the Boolay district by a spur recently selected for a Military road, between the Pudday and its Northern affluent, the Allay-choung, and reached Nyoungbenkyn, on the former stream, on the 7th March.

215. The Conservator proceeded thence to the South through the North Nawing and Upper Tsoon-choung districts to Dabee on the Middle Nawing, and thence to the South-West to Letkyee, in the Mahathaman district.

216. In the Shaboung district, Tharrawaddie division, the work of girdling and final demarcation of the Reserve boundaries was examined by the Conservator on the 17th March.

217. The Choungwah plantation was inspected on the 20th and the Queaymakeing plantation on the 23rd March. Proceeding thence *via* Thoungzai, Tsanuay, and the Hline river, the Conservator returned to Rangoon by the 26th March.

218. On the 19th May the Conservator proceeded to the Kyekpyoogan teak plantation, and thence Northward into the Magayee Forest district, returning to Rangoon *via* Toboowa on the Oak-kan-choung and the Hline river.

219. *Free grants of timber.* During the year grants of teak timber, for religious and public purposes, to the following extent, have been made in accordance with Schedule VI, Forest Rules.

Rangoon Division	152	
Tharrawaddie Division	222	
Sittang "	1,158	
Prome "	151	
Total	1,683	Logs.

220. In accordance with the orders of Gozernment, instructions have been issued for restricting free grants to parties residing in the Forest dstricts and localities where such timber cannot be purchased.

221. *Timber for P. W. Department.* During the year the Department was called upon to make special arrangements for the delivery of 1,550 logs of first class timber to the Department Public Works for construction of bridges on the Prome road. Seasoned timber not being available in all the Forest tracts, and the season being well advanced when the final requisition came to hand, the Department was not able to deliver more than 929 logs at the sites specified.

222. *Experiments with teak timber.* To bring the question of the greater durability of timber felled green to a satisfactory solution—it being generally believed that such timber retained more of the essential oil than girdled timber—several pieces of both descriptions of timber were forwarded for analysis to Mr. Broughton, Government Quinologist, Ootacamund, who, after repeated experiments, gave it as his opinion that as the girdled timber was found to yield as much resinous matter and oil as green timber, the practice of girdling cannot be said to affect the quality or durability of teak timber.

223. Experiments were made by Mr. Slym with sections of seasoned and green teak timber, which gave the following results :—

	lbs.	*Proportion of* *Wood fibre.*	*Water.*
Weight of one cubic foot seasoned teak timber ...	45	80 p. c.	20 p. c.
Do. do. green teak timber ...	75	60 p. c.	40 p. c.

224. Several changes have to be recorded in the Executive establishment of the Department.

225. The services of a somewhat promising young Officer have been lost to the Department by the decease at Akyab, on the 29th October 1870, of Mr. Manby Nightingale, Officiating Assistant Conservator, when on his way to Calcutta for the benefit of his health.

226. Mr. George Stratford appointed Sub Assistant Conservator in Government of India's Notification No. 21 F dated 23rd August 1870, arrived from India on 6th September 1870.

227. Mr. A, L. Hough appointed to officiate as Sub Assistant Conservator by the Local Government was definitely appointed by the Government of India from the 25th October 1870.

228. Mr. C. Bligh appointed additional Assistant Conservator of Forests 3rd grade in Government of India Notification No. 12 F dated 16th February 1871 reported his arrival at Rangoon on 20th March 1871.

229. The following transfers have been sanctioned in Government of India Notifications No. 31 F dated 1st June 1871,—No. 34 F dated 8th June 1871 and No. 37 F dated 20th June 1871.

Mr. I. Macpherson Asst. Conservator 2nd grade vice Mr E. Ludlow transfered to Burma (now absent on sick leave).	to Mysore.
Mr W. Rind, Sub Asst Conservator N. W. Provinces to Officiate for Mr Ludlow.....	to Burma,
Mr A. P. Aylmer Offg. Asst. Conservator 3rd grade	to Bengal.
Captain Douglas, Deputy Conservator 2nd grade, from Berar, as Deputy Conservator 1st grade...	to Burma.

230. Some changes in the control of Forest divisions have to be recorded.

231. Mr. James Adamson assumed charge of the Tharrawaddie division on the 3rd June 1870, but consequent on the temporary transfer of Mr. A. M. Buchanan, Assistant Conservator 2nd grade to the Prome Division, he was relieved of the charge of the Tharrawaddie division by Mr. I. Macpherson on the 1st December, and transferred to the Rangoon division to take up the duties of Personal Assistant to the Conservator.

232. Mr. Adamson relieved Mr. Daly of the charge of the Rangoon division on the 4th April 1871, and the latter officer assumed charge of the Tharrawaddie division on the 27th June 1871, *vice* Mr. I. Macpherson, who proceeded to Mysore on the 3rd July 1871.

233. The Conservator has reason to be satisfied with the manner in which the Executive Officers of the Department have generally performed their various duties during the year, but more particularly those in connection with the work of final demarcation of Reserved tracts in the Tharrawaddie division and the examination and selection of tracts for reservation in the Prome division, in which Mr. I. Macpherson, Mr. Aylmer and the several officers mentioned in Section 4, Part II of this report, were engaged.

234. The following officers however deserve special mention for the valuable assistance they have afforded the Conservator.

Mr. W. C. Graham, } *Deputy Conservators,*
Mr. M. J. Slym, }

Mr. F. Y. Elsner, }
Mr. James Adamson, } *Assistant Conservators.*
Mr. A. M. Buchanan, }

W. J. SEATON, Captain,
Conservator of Forests,
British Burma.

Rangoon,
3rd August 1871.

STATEMENTS.

STATEMENT

FOREST DEPARTMENT,

Extract from the Forest Day Books of the Forest Department, British from 1870 *to* 1871, *being a continuation of Statement I of Progress*

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey.	By whom surveyed.	No. of Tract Surveyed.	Trees counted in: Teak. I.	Teak. II.	Teak. III.	Teak. IV.	Padouk. Above 3 cubits.	Padouk. Below 3 cubits.	Cutch. Above 3 cubits.	Cutch. Below 3 cubits.	Pynkadoe. Above 3 cubits.	Pynkadoe. Below 3 cubits.
	Shaboung.													
Tharrawaddie ..	Between Kyoukah and Matgeeran Choung ..	1870-71.	Captain W. J. Seaton.	..	13	16	13	10	..	..	..	..	..	..
	Pounglin.													
	Wasway Choung	....	Mr. N. Daly ..	..	28	68	125	240	..	..	..	..	..	..
	Geewaykyoh and Wasway choungs	....	Do. ..	..	43	105	129	80	..	..	..	..	..	..
	Between Geeway and Wasway Choungs	....	Do. ..	..	24	56	82	130	..	..	..	..	..	..
	Thacot Myoung.....	....	Do. ..	..	7	45	81	440	..	..	..	..	..	..
	Geemah and Thacot Myoung.....	....	Do. ..	..	5	76	90	140	..	..	..	..	..	..
	Pounglin Choung water-shed and Phoon Myoung Choung ..	....	Do. ..	..	19	56	76	400	..	..	..	..	..	..
	Koonzangee	....	Do. ..	..	15	63	94	940	..	..	..	..	..	..
	Total....	....	.....	..	141	469	677	2,370	..	..	..	..	..	..
	Bawnee.													
Rangoon ..	Thayet Myoung	....	Do. ..	..	16	50	150	250	..	..	..	..	..	..
	Kyekadouktoung	....	Do. ..	..	10	30	69	230	..	..	..	..	..	..
	Oalaw Choung	....	Do. ..	..	12	52	185	450	..	..	..	..	..	..
	Myan choung.....	....	Do. ..	..	51	108	304	310	..	..	..	..	..	..
	Myan and Kyoung Choungs	....	Do. ..	..	17	46	56	100	..	..	..	..	..	..
	Kanazoe Myoung..	....	Do. ..	..	5	2	44	100	..	..	..	..	..	..
	Kawloyah Choung.. ..	....	Do. ..	..	54	213	423	825	..	..	..	..	..	..
	Total....	....	.....	..	165	501	1,231	2,265	..	..	..	..	..	..
	Maubee.													
	Thairbyoo and Mahin Choung	....	Captain W. J. Seaton.	..	8	14	172	430	..	..	..	..	..	..
	Total number counted.	....	.....	..	314	984	2,080	5,065	..	..	..	..	..	..
	Total number on 100 Acres	....	.....	..	93	290	614	1,496	..	..	..	..	..	..
	North Nawing, North.													
Prome	Between Chitamoay and Thabyai and North Nawing with Meimaoh....	....	Mr. A. L. Hough	..	210	290	236	154	5	8	9	..	..	..
	Between Chitamoay and Thabyai Choungs.	....	Do. ..	..	170	245	410	1,420	10	20	..	..	..	..
	Between Chitmoay Thabyai and Meimaoh Choungs	....	Do. ..	..	205	100	302	180	5	..	..	..	..	..
	Between Chitmoay and Meimaoh	....	Do. ..	..	210	86	280	502	22	34	..	..	..	..
	Carried over..	....	.....	..	795	721	1,318	2,256	42	62	9	..	..	..

I.

BRITISH BURMA.

Burma, shewing the number of Teak trees and woods of other kinds counted
Report of Forest Administration in British Burma, for 1870-71.

THE SURVEY TRACTS.								AREA SURVEYED.				NUMBER OF TREES ON 100 ACRES.						
ENGYEEN.		KOKOH.		ENG.		THITPYOO.												
Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.	Total of first three classes Teak trees on 100 acres.	Padouk.	Cutch.	Pynkadoe.	Engyeen.	Kokoh.	Eng.	Thitpyoo.
..	..	..	..	..	..	..	..	5,400	100	12·3	341	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	13,100	"	30·0	736	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	9,000	"	20·63	1,342	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	6,600	"	15·1	1,072	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	5,000	"	11·5	1,009	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	6,600	"	15·1	1,132	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	3,400	"	7·8	1,935	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	5,800	"	13·3	1,292	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	49,500	"	111·81	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	15,000	"	34·43	627	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	2,600	"	5·97	182	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	7,800	"	17·90	139	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	19,500	"	44·76	103	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	13,100	"	30·0	396	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	1,600	"	3·67	1,339	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	38,800	"	73·0	945	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	98,400	"	209·73	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	7,408	"	17·0	1,141	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	"	338·54	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	"	..	997	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	20,420	"	46·8	1,572	28	20	..	..	..	..	..
..	..	..	..	..	..	..	..	18,010	"	41·3	1,997	72	..	..	..	..	..	..
..	..	..	..	..	..	..	..	10,130	"	23·2	3,008	21	..	..	..	..	..	..
..	..	..	..	..	..	..	..	13,880	"	31·8	4,245	176	..	..	..	..	..	..
..	..	..	..	..	..	..	..	62,440	"	143·1	..	297	20	..	..	..	..	..

STATEMENT

FOREST DFPARTMENT,

Extract from the Forest Day Books of the Forest Department,

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey.	By whom Surveyed.	No. of Tract Surveyed.	Trees counted in: Teak. I.	Teak. II.	Teak. III.	Teak. IV.	Padouk. Above 3 cubits.	Padouk. Below 3 cubits.	Cutch. Above 3 cubits.	Cutch. Below 3 cubits.	Pingadoe. Above 3 cubits.	Pingadoe. Below 3 cubits.
	Brought forward..	....	.....	..	795	721	1,818	2,256	42	62	9	..	..	..
	North Nawing, North.—(Continued)													
Prome.	Between Meimaoh and Cheik Choungs	1870-71	Mr. A. L. Hough	..	525	452	441	262	16	1	..	..	..	..
	Between Meimaoh and North Nawing.....	....	Do. ..	..	20	15	34	60	1	1	..	..	..	..
	Between Pokyah and Cheik Choungs	....	Do. ..	..	697	302	296	215	15	3	..	..	..	..
	Total....	....	Do. ..	..	2,037	1,490	2,089	2,703	74	67	9	..	..	..
	North Nawing, South.													
	Between Gnamoizin Dodan and Patoyah Choungs	....	Do. ..	..	154	117	570	700	10	17	204	310	..	..
	Between Bamboodoung Hill and Gnamoizin Choung	....	Do. ..	..	87	70	76	48	..	..	95	70	104	58
	Do. do. ..	....	Do. ..	..	92	78	53	24	1	..	60	50	154	85
	Between Bamboocay-doung, Kyan and Gnamoizin Choungs and Nawing	....	Do. ..	..	75	40	45	20	1	..	20	100	58	13
	Between Bamboocay-doung and Gnamoi-zin Choungs.....	....	Do. ..	..	16	10	32	16	..	..	46	20	..	..
	Do. do. ..	....	Do. ..	..	61	45	8	11	5	2	50	40	25	3
	Do. do. ..	....	Do. ..	..	34	15	12	17	6	3	45	20	20	3
	Between Patayah Ky-otsain and Tsoon Choung	....	Do. ..	..	46	28	64	110	7	3	24	13	..	..
	Between Patayah and Kyetsin Choung.....	....	Do. ..	..	61	52	125	45	15	4	80	150	..	..
	Between Dodan and Patayah Choungs	....	Do. ..	..	126	70	57	40	9	4	57	25	72	..
	Between Dodan and Kodoke Choungs	....	Do. ..	..	17	5	10	3	..	..	20	5	36	8
	Between Bamboocay-doung and Kyan Ka-doke	....	Do. ..	..	23	12	26	22	..	..	24	12	47	22
	Between Dodan and Kyetsin Choungs	....	Do. ..	..	63	52	75	150	1	7	9	25	..	..
	Between Gnaloozan and Gnamoizin	....	Do. ..	..	83	52	53	45	..	..	160	77	155	104
	Between Gnaloozan and Sa-yoa Kyan Choungs	....	Do. ..	..	112	63	105	40	13	..	201	252	94	26
	Gnaloozan Choung East	....	Do. ..	..	8	4	13	10	4	..	60	60	14	4
	Between Ggapyan and Gnaloozan Choungs ..	....	Do. ..	..	305	195	132	81	15	10	158	118	272	68
	Between Ngapyan Aughnabem Myoung ..	....	Do. ..	..	282	107	51	43	5	15	242	98	490	95
	Ngamyan Choung Sub-district	....	Mr. G. Stratford.	..	57	220	103	280	5	...	245	372	..	..
	Between Ngamyo and Tasso Choungs	....	Do. ..	..	172	193	195	430	7	7	90	170	..	..
	Ngamyo Choung	....	Do. ..	..	122	127	187	350	9	..	30	130	..	..
	Carried over....	....	.....	..	1,996	1,555	2,087	2,485	113	72	1,920	2,117	1,541	487

I.—(*Continued.*)

BRITISH BURMA.

British Burma, shewing the number of Teak trees, &c.—(*Continued*)

THE SURVEY TRACTS.								AREA SURVEYED.				NUMBER OF TREES ON 100 ACRES						
ENGYEEN.		KOKOH.		ENG.		THITPYOO.												
Above 3 cubits	Below 3 cubits	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.	Total of first three classes Teak trees on 100 acres.	Padouk.	Cutch.	Pingadoe.	Engyeen.	Kokoh.	Eng.	Thitpyoo
..	..	..	..	..	..	..	..	62,440	100	143·1	..	297	20	..	..	..	..	..
..	..	..	..	..	..	..	..	48,970	,,	111·7	3,889	37	..	..	..	..	..	..
..	..	..	..	..	..	..	..	4,580	,,	10 4	663	19	..	..	..	..	..	..
..	..	..	..	..	..	..	..	34,950	,,	79·8	4,400	91	..	..	..	..	..	..
..	..	..	..	..	..	..	..	150,940	,,	345 0	..	444	20	..	..	..	..	..
..	..	..	..	..	..	..	..	32,410	,,	74 4	1,130	36	690	..	..	..	..	..
..	..	..	..	..	..	..	..	8,420	,,	19·3	1,207	..	855	840	..	..	..	..
..	..	..	..	..	..	..	..	13,940	,,	32 0	696	3	343	740	..	..	..	..
..	..	..	..	..	..	..	..	6,810	,,	15·6	1,025	6	769	455	..	..	..	..
..	..	..	..	..	..	..	..	3,950	,,	9 0	644	..	888	..	..	..	..	..
..	..	..	..	..	..	..	..	4,560	,,	10 4	1,096	67	865	269	..	..	..	..
..	..	..	..	..	..	..	..	4,750	,,	10·9	559	82	600	211	..	..	..	..
..	..	..	..	..	..	..	..	12,920	,,	29·6	466	33	125	..	..	..	..	.
..	..	..	..	..	..	..	..	10,510	,,	24·1	987	78	954	..	..	..	..	..
..	..	..	..	..	..	..	..	9,310	,,	21·3	1,187	61	385	338	..	..	..	..
..	..	..	..	..	..	..	..	4,970	,,	11 4	280	..	219	386	..	..	..	..
..	..	..	..	..	..	..	..	3,950	,,	9·0	677	..	400	766	..	..	..	..
..	..	..	..	..	..	..	..	9,040	,,	20·7	917	38	109	..	..	..		..
..	..	..	..	..	..	..	..	20,710	,,	47·5	406	..	500	546	..	..	..	..
..	..	..	..	..	..	..	..	25,960	,,	58·6	960	43	1,567	490	..	..	..	.
..	..	..	..	..	..	..	..	3,190	,,	7·3	342	54	1,643	346	..	..	..	..
..	..	..	..	..	..	..	..	32,900	,,	75·4	2,304	124	1,636	1,312	..	..	..	..
..	..	..	..	..	..	..	..	21,610	,,	49·5	1,998	87	882	2,710	..	..	..	..
..	..	..	..	..	..	..	..	50,120	,,	114·9	695	8	1,076	..	..	..	..	..
..	..	..	..	..	..	..	..	29,050	,,	66·6	840	21	890	..	..	..	..	..
.		..	..	..	..	..	..	28,390	,,	53·6	813	17	300	..	..	..	..	..
.	..	..	..	..	..	..	..	3,32,470	..	761·1	..	758	15,250	9,400	..	..	..	..

STATEMENT

FOREST DEPARTMENT,

Extract from the Forest Day Books of the Forest Department,

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey.	By whom Surveyed.	No. of Tract Surveyed.	Trees counted in: Teak. I.	Teak. II.	Teak. III.	Teak. IV.	Padouk. Above 3 cubits.	Padouk. Below 3 cubits.	Cutch. Above 3 cubits.	Cutch. Below 3 cubits.	Pingadoe Above 3 cubits	Pingadoe Below 3 cubits
	Brought forward..	....	.....	..	1,996	1,555	2,087	2,485	118	72	1,020	2,117	1,541	487
	North Nawing South.—(Continued).													
Prome	Between Ngamyo and Shoayladoo Choungs..	1870-71	Mr. G. Stratford.	..	98	112	137	260	4	..	80	69	..	..
	Between Ngapyoung and Mahpyo Choung.	....	Do. ..	..	30	40	98	80	0	1	40	87	..	..
	Between Ngamyo and Meedoo Choung	....	Do ..	..	170	120	160	260	1	5	..	..	..	..
	Between Wahpyoo and Meedoo Choung....	....	Mr. A L. Hough	..	206	210	680	240	19	..	151	217	..	..
	Between Tsin Thay and Meedoo Choung..	....	Do. ..	..	509	440	620	622	37	14	328	548	..	..
	Between Tsin Thay and Thayet Myoung	....	Mr. G. Stratford	..	598	384	736	698	46	34	..	..	..	..
	Between Thayamyoe and Sathwah	....	Do. ..	..	54	66	300	280	10	..	..	..	..	..
	Between Thavamyoe and Koon Choung .	....	Do. ..	..	271	217	467	420	23	10	..	.	..	..
	Between Koon and Kathai Choungs.....	....	Do. ..	..	329	249	814	650	60	28	..	..	..	.
	Between Thavetameing and Koon Choungs ..	....	Do. ..	..	73	93	200	260	24	..	..	.	..	..
	Between Kathai and Mamoo Choungs	....	Do. ..	..	224	202	552	510	20	28	..	..	..	..
	Between Tsatwah and Thayet Choungs.....	....	Do. ..	..	104	85	276	103	11	5	..	.	..	..
	Between Thayet and Thayan Choungs	....	Do ..	..	160	123	293	160	15	..	.		..	..
	Total....	....	.....	..	4,822	3,896	7,420	6,978	389	192	2,519	3,029	1,541	487
	Tsoon Choung, North.													
	Between Natkangma and Tsoon Choungs ..	....	Mr. A L. Hough	..	186	900	1,079	991	11	18	245	271	..	..
	Between Natkangma & Meahkado Choungs	....	Do ..	..	70	110	290	202	1	..	84	42	..	..
	Between Thonedoung and Meakadine	....	Mr. G. Stratford	..	17	21	64	130	4	..	69	104	..	..
	Between Kyoutha Pintsien and Thonedoung Choungs	....	Do ..	..	84	103	214	920	11	..	85	379	..	..
	Between Kyanthay Kitwa Choungs	....	Mr. A. L. Hough	..	580	612	860	1,160	7	5	..	..	..	..
	Between Thitwah and Tsoongoung Choungs..	....	Do ..	..	1,945	2,240	1,706	2,337	35	52	..	..	..	..
	Pokeia Choung	...	Mr G. Stratford	..	70	47	220	500	2	..	..	..	..	..
	Between Thitwah and Tseingoung Choungs..	....	Do. ..	..	107	85	165	510	4	3	..	..	..	.
	Between Thitwah and Tsoon Choung	....	Do ..	..	111	110	296	860	12	..	..	..	..	..
	Total..	...	.....	..	3,120	4,232	4,894	7,610	87	78	433	796	..	..
	Tsoon Choung South Sarinyoung Nahbaibyoamouk Choungs ..	....	Mr. A. L. Hough	..	10	7	39	113	2	1	4	17	..	..
	Do, Thallegah .	....	Do. ..	..	57	50	66	490	3	5	114	86	..	.
	Carried over .	...	.....	..	67	57	105	609	5	6	118	103	..	.
		...	....	..	7,942	8,128	12,314	14,588	476	270	2,952	3,825	1,541	487

I.—(*Continued.*)

BRITISH BURMA.

British Burma, shewing the number of Teak trees, &c.—(*Continued.*)

THE SURVEY TRACTS.								AREA SURVEYED.			Total of first three classes teak trees on 100 acres.	NUMBER OF TREES ON 100 ACRES.						
ENGYEEN.		KOKOH.		ENG.		THITPYOO.												
Above 3 cubits.	Below 2 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.		Padouk.	Cutch.	Pyukadoe.	Engyeen.	Kokoh.	Eng.	Thitpyoo.
..	..	..	..	..	..	..	..	3,22,470	100	761·1	..	758	15,250	9,409	..	..	..	..
..	..	..	..	..	..	..	..	10,420	,,	23·9	1,451	16	590	..	..	..	..	..
..	..	..	..	..	..	..	..	6,050	,,	15·2	1,195	46	835	..	..	..	..	..
..	..	..	..	..	..	..	..	9,300	,,	21·3	2,112	28	..	..	..	..	..	..
..	..	..	..	..	..	..	..	34,265	,,	78·5	4,577	75	651	..	..	..	..	..
..	..	..	..	..	..	..	..	48,350	,,	110·8	4,384	136	2,925	..	..	..	..	..
..	..	..	..	..	..	..	..	37,850	,,	86·7	6,795	255	..	..	..	..	..	..
..	..	..	..	..	..	..	..	8,450	,,	19·3	2,170	52	..	..	..	..	..	..
..	..	..	..	..	..	..	..	13,250	,,	30·4	3,108	108	..	..	..	..	..	..
..	..	..	..	..	..	..	..	28,350	,,	60·1	3,842	360	..	..	..	..	..	..
..	..	..	..	..	..	..	..	8,150	,,	18·7	1,957	129	..	..	..	..	..	..
..	..	..	..	..	..	..	..	25,400	,,	58·3	1,694	74	..	..	..	..	..	..
..	..	..	..	..	..	..	..	11,780	,,	27·0	1,722	58	..	..	..	..	..	..
..	..	..	..	..	..	..	..	20,000	,,	45·9	1,889	53	..	..	..	..	..	..
..	..	..	..	..	..	..	..	5,95,185	,,	..	....	2,157	20,251	9,409	..	..	..	..
..	..	..	..	..	..	..	..	85,030	,,	195·0	2,458	44	773	..	..	..	..	..
..	..	..	..	..	..	..	..	22,475	,,	51·5	912	2	148	..	..	..	..	..
..	..	..	..	..	..	..	..	17,280	,,	39·6	257	10	437	..	..	..	..	..
..	..	..	..	..	..	..	..	35,300	,,	81·0	495	13	573	..	..	..	..	..
..	..	..	..	..	..	..	..	43,660	,,	100·2	3,965	23	..	..	..	..	..	..
..	..	..	..	..	..	..	..	48,180	,,	110·4	28,704	273	..	..	..	..	..	..
..	..	..	..	..	..	..	..	16,130	,,	37·0	910	5	..	..	..	..	..	..
..	..	..	..	..	..	..	..	17,000	,,	39·0	915	18	..	..	..	..	..	..
..	..	..	..	..	..	..	..	22,580	,,	51·7	1,911	39	..	..	..	..	..	..
..	..	..	..	..	..	..	..	307,635	,,	..	....	427	1,931	..	..	..	1 ..	..
..	..	..	..	..	..	..	..	7,292	,,	16·7	335	18	125	..	..	..	..	..
..	..	..	..	..	..	..	..	10,706	,,	24·5	706	33	816	..	..	..	..	..
..	..	..	..	..	..	..	..	17,998	..	41·2	..	51	941	..	..	..	..	....
..	..	..	..	..	..	..	..	902,820	—	2068·6	..	2,584	22,182	9,409	..	..	..	

STATEMENT

FOREST DEPARTMENT,

Extract from the Forest Day Books of the Forest Department,

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey.	By whom surveyed.	No. of Tract Surveyed	Trees counted in: Teak I	Teak II	Teak III	Teak IV.	Padouk. Above 3 cubits.	Padouk. Below 3 cubits	Cutch. Above 3 cubits	Cutch. Below 3 cubits.	Pyinkadoe Above 3 cubits.	Pyinkadoe Below 3 cubits.
	Brought forward	..	.....	..	7,942	8,128	12,814	14,588	476	270	2,952	3,[illegible]	1,541	487
		..	.....	..	67	57	105	609	5	6	118	103	..	..
	Tsoon Choung South. (Continued.)													
Prome	Between Pattiah and Thallegah	1870-71	Mr. A L Hough	..	22	26	30	260	3	3	101	230	..	.
	Pattiah Choung east ..	....	Do. ..	..	199	248	301	1,073	17	23	253	570	..	..
	Between Nahbalbyo amouk and Sarmyoung Choungs.	....	Do. ..	..	61	46	182	374	5	..	52	118	..	..
	Myoung matha and Thallegah Sub-district	....	Mr. G. Stratford	..	139	73	103	568	24	2	106	88	..	..
	Between Nahbalbyo-amouk and Allay Choungs	....	Mr. A. L Hough	..	291	154	236	1,510	8	6	35	40	..	..
	Nabalbyo Allay.....	....	Mr. G. Stratford	..	149	132	171	1,790	30	14	30	127	..	..
	Between Nabalbyo and Kheoddane Choungs.	....	Do. ..	..	52	35	45	190	1	..	..	..	..	..
	Between Nabalbyo, Ashale and Koke Choungs	....	Do. ..	..	56	60	70	710	14	2	1	..	..	.
	Between Koke and Tsoon Choungs and Mahoon Myoung.....	....	Mr. A L. Hough	..	97	111	130	346	2	..	80	114	..	..
	Between Koke and Tsoon Choungs	....	Do. ..	..	40	36	120	340	1	1	100	110	..	..
	Between Koke Tsoon and Mahoon Myoung.	...	Do. ..	..	37	60	84	800	..	..	18	10	..	..
	Between Mahoon Myoung, Tsoon and Kathai Choungs	....	Mr. G. Stratford	..	76	65	130	130	15	..	1	8	..	..
	Between Tsoon and Kathai Choungs.....	....	Do. ..	..	37	25	44	70	1	..	..	..	..	..
	Between Nahkhan and Tsoon Choungs	....	Do ..	..	80	150	210	550	6	8	1	..	..	..
	Between Nahkhan and Yeamashee Choungs..	....	Mr. A L Hough	..	420	265	144	890		..	..	..	..	..
	Between Yeamashee and Tsoon Choungs ..	....	Do ..	..	401	202	99	570	2	2	1	..	..	..
	Total. ..	....	.....	..	2,277	1,740	2,264	10,760	134	67	897	1,518	..	..
	Middle Nawing.													
	Oolayzway Sub-district	....	Mr. A P Aylmer	..	418	219	557	2,918	8	..	202	605	163	..
	Banguay do. ..	....	Do. ..	..	81	83	97	840	..	..	93	125	72	..
	Mayzallee and Thayet Sub-district.....	....	Do ..	..	36	22	40	340	..	..	333	..	..	..
	Dabee Sub disirict . ..	....	Do ..	..	1,097	473	1,200	2,236	70	..	24	..	819	..
	Shoayloung do ..	....	Do. ..	..	1,078	412	1,015	1,716	107	..	235	..	927	..
	Pooayghoon	....	Do ..	..	855	328	402	1,077	76	..	413	..	730	..
	Between Tanokto Choung and Gumboolay	....	Do. ..	..	45	26	91	60	3	..	38	..	20	..
	Carried over.	. ..	.....	..	3,610	1,563	3,462	9,187	264	.	1,338	820	2,731	..
		...	.....	..	10,219	9,868	14,578	25,348	610	337	3,849	5,343	1,541	487

I.—(*Continued.*)

BRITISH BURMA.

British Burma, shewing the number of Teak trees, &c.—(*Coutinued.*)

THE SURVEY TRACTS.								AREA SURVEYED.				NUMBER OF TREES ON 100 ACRES.						
ENGYEEN.		KOKOH.		ENG.		THITTYOO.												
Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.	Total of first three classes Teak trees on 100 acres.	Padouk.	Cutch.	Pynkadoo.	Engyeen.	Kokoh.	Eng.	Thitpyoo.
..	..	..	..	..	..	..	..	902,820	..	2068·6	..	2,584	22,182	9,409	..	..	..	..
..	..	..	..	..	..	..	..	17,998	..	41·2	..	51	941	..	..	..	..	..
..	..	..	..	..	..	..	..	4,890	100	11· 2	696	54	2,055	..	..	..	..	..
..	..	..	..	..	..	..	..	20,830	"	70· 6	3,851	210	3,777	..	..	..	..	..
..	..	..	..	..	..	..	..	18,195	"	41· 7	1,402	658	..	..	..	..	..	..
..	..	..	..	..	..	..	..	24,480	"	56· 9	2,845	201	950	..	..	..	..	..
..	..	..	..	..	..	..	..	29,030	"	66· 5	2,039	38	170	..	..	..	..	..
..	..	..	..	..	..	..	..	37,535	"	76· 0	1,950	191	411	..	..	..	..	..
..	..	..	..	..	..	..	..	4,570	"	10· 2	1,294	10	..	..	..	..	..	..
..	..	..	..	..	..	..	..	15,410	"	35· 3	541	45	8	..	..	..	..	..
..	..	..	..	..	..	..	..	13,545	"	31· 0	1,000	6	626	..	..	..	..	..
..	..	..	..	..	..	..	..	18,460	"	42· 3	463	5	496	..	..	..	..	..
..	..	..	..	..	..	..	..	10,905	"	25· 0	924	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	27,460	"	63· 0	430	24	14	..	..	..	..	..
..	..	..	..	..	..	..	..	7,920	"	18· 2	582	5	..	..	..	..	..	..
..	..	..	..	..	..	..	..	22,800	"	52· 3	852	26	2	..	..	..	..	..
..	..	..	..	..	..	..	..	33,690	"	77· 3	2,247	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	11,905	"	27· 3	2,571	15	4	..	..	..	..	..
..	..	..	..	..	..	..	..	3,19,623	..	745·0	..	1,539	10,349	..	..	..	..	..
..	..	..	..	..	..	..	..	..	"	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	21,600	"	49· 5	1,400	..	907	396	..	..	..	..
..	..	..	..	..	..	..	..	17,875	"	41· 0	206	..	812	..	..	..	..	..
478	..	..	..	..	..	..	..	1,98,775	"	454·5	6,900	175	60	2,066	1,630	..	..	..
308	..	..	..	..	..	..	..	1,92,335	"	417· 5	8.000	346	625	3,112	884	..	..	..
329	..	1	..	..	..	..	..	1,00,795	"	229· 0	5,800	305	1,213	2,692	984	..	..	..
..	..	..		..	..	..	..	19,360	"	45· 0	400	6	84	44	..	..	..	..
1,115	..	1	..	..	..	..	..	5,50,740	..	1,266·5	..	832	3,701	8,310	3,498	..	..	..
..	..	..	..	..	..	..	..	12,22,443	..	2813·6	..	4,123	32,531	9,409	..	..	..	..

STATEMENT

FOREST DEPARTMENT,

Extract from the Forest Day Books of the Forest Department,

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey.	By whom Surveyed.	No. of Tract Surveyed.	Trees counted in: Teak. I.	Teak. II.	Teak. III.	Teak. IV.	Padouk. Above 3 cubits	Padouk. Below 3 cubits	Cutch. Above 3 cubits.	Cutch. Below 3 cubits	Pingadoe Above 3 cubits.	Pingadoe Below 3 cubits
	Brought forward	....	.....	..	10,219	9,868	14,578	25,348	610	337	3,849	5,343	1,541	487
		....	.....	..	3,610	1,568	3,462	9,187	264	..	1,338	820	2,731	..
	Head-waters of Tanokto Choung and Water shed.													
Prome.	Between South and Middle Nawing Choungs	1870-71.	Mr. A.P. Aylmer	..	26	13	10	30	4	..	20	..	10	..
	Between Tanokto and Woongallay Choungs ..	....	Do. ..	..	55	18	45	23	19	..	18	..	27	..
	Kyouktagyle Sub-district	....	Do. ..	..	84	36	132	137	12	..	65	..	105	..
	Head waters of the Woongalay and Ayahtoung Choungs	....	Do. ..	..	38	43	87	83	5	..	35	..	100	..
	Between Ayahtoung and Htawkyan Choungs	....	Do. ..	..	12	15	44	36	8	..	30	..	10	..
	Between Teokee Choung and do. Htawkyan Choung ..	....	Do. ..	..	5	10	46	87	10	..	77	..	16	..
	Between Toung and Allay Nawing Choungs Head waters of the Htawkyyan Choungs	....	Do. ..	..	31	10	25	17	13	..	70	..	30	..
	Between Toung and Allay Nawing Choungs	....	Do. ..	..	314	113	170	54	7	..	..	..	175	..
	Head water of Tekta Choungs.....	....	Do. ..	..	20	13	28	29	16	..	40	..	27	..
	Between Tsetka Pouksingtoo Choungs.....	....	Do. ..	..	80	15	119	44	10	..	30	..	60	..
	Head waters of Poungsaingtoo	....	Do. ..	..	130	38	46	133	6	..	..	..	65	..
	Between Pounksaingtoo and Teonkwah Choungs	....	Do. ..	..	78	32	57	220	18	..	..	..	82	..
	Between Gwaydouke and Wetapyoo Choung	....	Do. ..	..	42	18	20	62	10	..	..	..	40	..
	Between Toukpoke and Tongwa Choungs..	....	Do. ..	..	74	38	105	78	9	..	..	..	40	..
	Laikpoke Choungs Sub-district	....	Do. ..	..	43	27	43	62	..	..	..	..	50	..
	Bamboung Choung North.....	....	Moung Way	..	1,400	1,999	7,923	14,803	22	..	2,902	..	1,093	..
	Do. South..	....	Do. ..	..	1,324	1,488	4,899	4,716	27	..	7,506	..	1,310	..
	Moe Loung Choung, West	....	Do. ..	..	2	1	8	6	..	..	472	..	..	..
	Do. North..	....	Do. ..	..	17	35	104	242	..	..	1,077	..	..	..
	Do. South..	....	Do. ..	..	875	1,364	5,636	10,351	36	..	10,681	..	2,167	..
	Mahataman Sub-district East	....	Do. ..	..	429	1,143	8,112	8,978	47	..	2,942	..	7,122	..
	Do. South..	....	Do. ..	..	96	212	1,648	835	..	..	234	..	895	..
	Total....	....	.....	..	8,794	8,244	32,769	50,248	543	..	27,533	820	16,125	..
	Carried over..	....	.....	..	19,013	18,112	47,347	75,591	1,153	337	31,382	6,163	17,666	487

I—(*Continued.*)

BRITISH BURMA.

British Burma, shewing the number of Teak trees, &c.—(Continued.)

THE SURVEY TRACTS.								AREA SURVEYED.				NUMBER OF TREES ON 100 ACRES.						
ENGYEEN.		KOKOH.		ENG.		THITPYOO.												
Above 3 cubits	Below 2 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.	Total of first three classes teak trees on 100 acres.	Padouk.	Cutch.	Pyinkadoe.	Engyeen.	Kokoh.	Eng.	Thitpyoo.
..	..	..	..	..	..	..	..	12,22,443	..	2,813·6	..	4,123	32,531	0,400	..	..	..	..
1,115	..	1	..	..	..	..	..	5,50,740	..	1,236·5	22,700	832	3,701	8,310	3,498	..	..	..
8	..	..	..	..	..	..	..	7,480	100	17 0	300	23	117	58	29	..	..	..
..	..	..	..	..	..	..	..	9,450	,,	21 0	600	90	86	139	..	..	..	..
64	..	..	..	..	..	..	..	18,295	,,	42·0	600	28	145	250	152	..	..	..
..	..	..	..	..	..	..	..	11,140	,,	25·0	600	20	140	400	..	..	..	..
..	..	..	..	..	..	..	..	6,530	,,	15·0	500	53	200	67.	..	..	..	..
..	..	..	..	..	..	..	..	8,080	,,	18 0	300	56	428	89	..	..	..	..
..	..	..	..	..	..	..	..	9,450	,,	21·0	200	62	333	143	..	..	..	..
178	..	..	..	..	..	..	..	28,006	,,	88·0	1,300	15	395	302	..	..	..	..
..	..	..	..	..	..	..	..	8,400	,,	19 0	300	84	210	142	..	..	..	..
40	..	..	..	..	..	..	..	11,460	,,	26·0	800	38	114	228	154	..	..	..
96	..	..	..	..	..	..	..	14,370	,,	33·0	600	18	..	198	290	..	..	..
30	..	..	..	..	..	..	..	15,050	,,	34 0	500	53	..	244	88	..	..	..
47	..	..	..	..	..	..	..	6,945	,,	16 0	500	62	..	248	294	..	..	..
46	..	..	..	..	..	..	..	10,600	,,	24 0	800	37	..	166	192	..	..	..
..	..	..	..	..	..	..	..	8,830	,,	20 0	600	.	..	250	..	..	..	..
508	..	1	..	..	..	583	..	2,05,300	,,	513·3	28,163	48	9,343	1,312	804	3	..	3,427
1,116	..	..	..	117	..	..	..	2,00,700	,,	458·51	23,135	79	18,803	3,815	2,888	..	435	..
..	..	..	..	..	..	27	..	11,700	,,	26 9	408	..	1,755	.	..	..	..	100
21	..	..	..	..	..	290	..	31,200	,,	71·7	418	..	3,034	..	56	..	..	335
2,859	..	1	..	6,186	..	2,544	..	2,88,500	,,	663·25	18,433	61	26,751	15,166	7,111	2	14,075	6,449
6,848	..	90	..	39,307	..	83	..	6,91,155	,,	1,590·16	20,625	118	6,099	13,352	11,906	227	77,462	53
872	..	21	..	4,168	..	25	..	1,43,200	,,	330·27	5,138	..	682	2,233	2,438	58	9,566	64
13,845	..	114	..	49,778	..	3,502	..	22,96,621	..	5,319·59	..	1,777	72,286	47,162	29,900	290	1,01,538	10,928
13,845	..	114	..	49,778	..	3,502	..	35,19,064	..	8,133 19	..	5,900	104817	56,571	29,900	290	1,01,538	10,928

STATEMENT

FOREST DEPARTMENT,

Extract from the Forest Day Books of the Forest Department,

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey	By whom surveyed	No. of Tract Surveyed	Trees counted in: Teak I	Teak II	Teak III	Teak IV	Padouk. Above 3 cubits	Padouk. Below 3 cubits	Cutch Above 3 cubits	Cutch Below 3 cubits	Pynkadoh Above 3 cubits	Pynkadoh Below 3 cubits
	Brought forward	..	.....	..	19,013	18,112	47,347	75,591	1,153	377	31,382	6,163	17,666	487
	South Nawing North													
Prome	Tsattsetyah Choung...	1870-71	Mr A M Buchanan	..	3	3	28	358	..	..	170	..	..	..
	Guobin Choung	....	Do. ..	..	36	107	178	776	..	..	626	.	39	..
	Myotyehbouk	....	Do. ..	..	27	54	57	285	..	..	280	.	5	..
	Tingwah Myoung. .	....	Do .	..	7	10	56	187	8	..	470	..	45	..
	Palangkokuay Myoung	....	Do. ..	..	..	3	14	60	1	..	174	..	5	..
	Gnahuay Myoung ...	....	Do. ..	..	..	..	..	5	..	..	376	..	1	..
	Kyekaryoung..... . .	.. .	Do. .	..	..	16	50	76	1		340	.	6	..
	Total...	....	.....	..	73	193	383	1,747	10	.	2,436	..	104	..
	South Nawing, South													
	Between Kajee and Kyin Choungs .. .	....	Do. ..	..	2	4	71	123	..	..	..	..	..	..
	Myoung Notgyee and Guaydouk Choungs .	....	Do .		7	11	38	198	..	..	504	..	35	.
	Shodoungbouk	....	Do .	..	5	13	41	104	..	..	108	..	37	..
	Zoongoo Toung and Tsapyah	....	Mg : Poh O ..	..	20	5	54	111	.	.	..	..	..	..
	Gan Choung	....	Do. ..	..	20	10	26	23	..	..	..	..	..	..
	Looboung	....	Do. .	..	33	11	28	32	..	..	..	..	..	..
	Thadwoot Loothay and Tinwah	....	Do. ..	..	115	51	79	66	..	..	..	..	..	..
	Tsesetyoh and Thapan Myoung	....	Do ..	..	135	36	74	73	..	..	..	..	..	..
	Oke Shit Toung	....	Do. ..	..	13	12	25	18	..	..	..	..	..	—
	Between Obohlangalay and Oobohlangyee ..	....	Do ..	..	55	8	27	19	..	..	..	..	..	..
	Chinuay and Choungbyouk.....	....	Do. .	..	156	59	142	113	..	..	..	..	..	..
	Total....	....	.....	..	570	220	605	880	..	..	612	..	72	..
	Boolay District.													
	Sassoowah	....	Mg : Poh O	..	52	58	440	1,024	..	..	..	..	..	..
	Kyeenee	....	Do. ..	..	24	23	86	173	..	..	..	..	..	..
	Bangoung	....	Do. ..	..	129	429	847	1,526	..	..	..	..	..	..
	Choungoungyee	....	Do. ..	..	2,070	1,135	4,393	4,941	..	..	..	..	..	..
	Pudday	....	Do. ..	..	412	178	449	557	.	..	..	..	..	..
	Total...	....	Do ..	..	2,687	1,823	6,215	8,221	..	..	..	..	.	..
	Total number counted	....	Do. ..	..	22,843	20,348	54,561	86,439	1,163	337	34,430	6,163	17,842	487
	Total number on 100 Acres	....	.....	..	364	302	850	1,308	..	..	..	..	..	..
	Carried over	....	.....	..	..	..	..	..	..	..	..	..	..	..

I.—(*Continued.*)

BRITISH BURMA.

British Burma, shewing the number of Teak trees, &c.—(*Continued*)

THE SURVEY TRACTS.								AREA SURVEYED.			Total of first three classes Teak trees on 100 acres.	NUMBER OF TREES ON 100 ACRES.						
ENGYEEN.		KOKOH		ENG.		THITPYOO.												
Above 3 cubits	Below 3 cubits.	Above 3 cubits	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.		Padouk	Cutch.	Pingadoe.	Engyeen.	Kokoh.	Eng.	Thitpyoo.
13,845	..	114	..	49,778	..	3,502	..	25,19,064	..	8,133 19	..	5,900	104817	56,571	29,900	290	1,01,538	10,928
..	..	..	..	..	..	91	..	11,300	160	25·96	132	..	656	..	..	..	..	351
..	..	..	..	..	..	300	.	34,150	,,	78·3	410	..	799	50	..	..	..	388
..	..	..	..	..	..	164	..	17,400	,,	39 9	346	..	702	13	..	..	..	411
..	..	..	..	..	..	..	.	8,200	,,	18·8	388	42	2,500	255	..	..	..	..
..	..	..	..	..	..	.	..	8,260	,,	18·8	409	5	925	27	..	..	..	..
..	..	..	..	..	..	..	..	4,900	,,	11 2	..	..	3,357	9	..	..	..	..
..	..	..	..	..	..	.	..	8,400	,,	19 3	342	5	1,761	31	..	..	..	..
..	..	..	..	..	..	555	..	92,550	,,	212 28	..	52	10,700	385	..	..	..	1,145
..	..	..	..	..	..	..	..	10,000	,,	22·9	336	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	15,300	,,	35 1	169	..	1,435	100	..	..	..	..
..	..	1	..	..	..	..	.	4,000	,,	9 2	641	..	1,174	492	..	10	..	..
..	..	..	..	..	..	..	.	17,100	50	19·6	449	.	..	..	..	..	..	..
..	..	..	..	..	..	..	..	25,000	,,	2 8	200	..	.	..	..	..	..	..
..	..	..	..	..	..	..	..	18,300	,,	21 0	347	..	.	..	..	..	..	..
..	..	..	..	..	..	..	..	34,600	,,	39·7	617	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	35,100	,,	40 2	609	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	9,600	,,	11 0	454	.	..	..	..	..	..	..
..	..	..	..	..	..	..	..	16,300	,,	18·7	481	..	..	..	..	..	..	..
.	..	..	.	..	..	..	..	92,700	,,	106 4	336	..	..	..	..	..	..	..
..	..	1	..	..	..	..	..	2,78,000	..	320·6	..	..	2,609	502	..	10	..	..
..	..	..	..	..	..	..	..	1,88,840	50	219 0	251	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	83,700	,,	96·0	188	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	2,15,400	,,	247·2	568	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	11,34,600	,,	1,302·3	583	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	2,11,800	,,	243 1	427	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	18,34,340	..	2107·6	..	..		.	..	.	..	..
13,845	.	115	..	49,778	..	4,057	..	..	..	10,779·65	..	5,952	118126	57,458	29,900	300	1,01,538	12,073
..	..	..	..	..	..	..	..	..	..	..	1,516	..	..	..	..	..	..	..
.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

STATEMENT

FOREST DEPARTMENT,

Extract from the Forest Day Books of the Forest Department,

Name and Number of Divisions.	Name of Forest Tracts.	Year of Survey.	By whom surveyed.	No. of Tract Surveyed.	Trees counted in Teak. I.	Teak. II.	Teak. III.	Teak. IV.	Padouk. Above 3 cubits.	Padouk. Below 3 cubits.	Cutch. Above 3 cubits.	Cutch. Below 3 cubits.	Pynkadoe. Above 3 cubits.	Pynkadoe. Below 3 cubits.
	Brought forward...	..	.....	..	..	..	..	..	..	..	..	..	..	..
	Padah.													
Sittang.....	Pazeeben Choung	1870-71.	Captain W. J. Seaton.	..	57	48	33	46	..	..	..	..	..	..
	Tinmacor Toung	....	Do. ..	..	31	29	14	30	..	..	..	..	..	..
	Total number counted.	....	.....	..	88	77	47	76	..	..	..	..	..	..
	Total number on 100 Acres	....	.....	..	320	288	179	284	..	..	..	..	..	..
	Attaran.													
Salween.....	Goongyee	....	Do. ..	..	16	13	80	53	..	..	..	..	..	..
	North Mitigate Forests.													
	Teewahpahdo and Teeklaythur Choung...	....	Do. ..	..	5	6	23	42	..	..	..	..	..	..
	South Mitigate Forests.													
	Paingqueng and Wah-krur Choungs	....	Do. ..	..	8	1	7	4	..	..	..	..	..	..
	South Nat Choung (Mayoh Choung).....	....	Do. ..	..	10	25	60	15	..	..	..	..	..	..
	North and South Nat Choung	....	Do. ..	..	4	11	79	22	..	..	..	..	..	..
	Total number counted.	....	.....	..	43	56	249	136	..	..	..	..	..	..
	Total number on 100 Acres.....	....	.....	..	35	46	205	111	..	..	..	..	..	..

I—(*Concluded.*)

BRITISH BURMA.

British Burma, shewing the number of Teak trees, &c.—(*Continued.*)

THE SURVEY TRACTS.								AREA SURVEYED.			Total of first three classes teak trees on 100 acres.	NUMBER OF TREES ON 100 ACRES.						
ENGYEEN.		KOKOH.		ENG.		THITPYOO.												
Above 3 cubits.	Below 2 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Above 3 cubits.	Below 3 cubits.	Length of Tract Surveyed.	Width.	Area in Acres.		Padouk.	Cutch.	Pynkadoe.	Engyeen.	Kokoh.	Eng.	Thitpyoo.
..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	8,240	100	18·9	730	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	3,400	"	7·8	948	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	11,640	"	26·7	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	"	..	796	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	13,700	"	31·1	850	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	13,550	"	31·3	108	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	12,700	"	20·1	54	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	4,500	"	10·3	922	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	8,600	"	19·7	477	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	53,050	"	121·5	..	..	..	..	..	..	..	..
..	..	..	..	..	..	..	..	..	..	..	286	..	..	..	..	..	..	..

STATEMENT

FOREST DEPARTMENT

STATEMENT *of Teak trees girdled and*

Name and Number of Section.	Name of Revising Officer.	Forest.	Sub-District.
I. Rangoon.....	Nugent Daly Esq	Pounglin	Pounglin choung .....
			Thakwopmyoung .....
			Koongangyee choung .....
			Wahsway choung East ..
			Ditto ditto West ..
		Bawnee	Kawleya choung .....
			Myan ditto .....
			Kanazoe Myoung.....
			Kyoun choung .....
			Oalaw ditto ....
			Minbootoung .....
			Quaybeway ....
			Sopalaw choung .....
			Wappenming .....
			Paleiktaw . ...
			Thaymyoung .....
			Quayedeingning ....
			Total Rangoon division...
II. Tharrawaddie.....	A. I. Macpherson Esq..	Shaboung	Kaboung .....
			Kadingouk .....
			Mageeram West .....
			Ditto East .....
		Minlha	Teingdeing .....
			Woongay ....
			Tatooma .....
			Napagyee West .....
			Ditto East .....
			Tsayohbyouk .....
			Total Tharrawaddie division.....
III. Prome.....	F. Y. Elsner Esq	Choungoungyee.....	Thayetmyoung.....
			Hnetdowmyoung tikewah..
			Magpaygwair... ....
			Bayong choungoung .....
			Tsameengeemyoung.....
			Thambayahmyoung .....
			Kyekgalay Myoung.....
			Moungtergolay choung ...
			Ghogho Myoung .....
			Gnatpee ditto .....
			Podoung ... .
	Moung Shoay Gan.....	North Nawing	Bambouaytoung West.....
			Gnamooay Sin choung North ....
			Gnamooay Sin choung South .....
			Total Prome division ..

II.

BRITISH BURMA.

Forest Work done in season 1870-71.

Trees girdled.	First class trees estimated.	Trees counted by Revising Officer.		Percentage of girdled trees counted.	Percentage of first class trees girdled.	Creepers cut.	Young teak cleared.	Other trees girdled.	No of other kinds of trees cut down.	Remarks.
		Trees girdled.	First class trees.							
287 378 407 435 493	..	1,982	572	...	...	...	...	...	...	
886 1,460 107 339 401 164 47 127 49 131 117 112	..	3,570	530	.....	...	...	...	...	...	
6,000	...	5,552	1,102	..	...	...	...	..	...	
751 1,216 590 142	...	670	217	...	...	...	...	...	...	
1,057 370 83 1,265 1,014 236	...	41	9	...	...	...	...	...	...	
7,054	..	711	226	...	...	...	...	...	...	
286	...	.....	.....	...	...	...	...	..	...	
210	...	.....	.....	...	...	...	...	...	...	
163	...	.....	.....	...	...	...	...	...	...	
209	...	.....	.....	...	...	...	...	...	...	
166	...	.....	.....	...	...	...	...	...	...	
324	...	.....	.....	...	...	...	...	...	...	
73	...	.....	.....	...	...	...	...	...	...	
101	...	.....	.....	...	...	...	...	...	...	
286	...	.....	.....	...	...	...	...	...	...	
84	...	.....	.....	...	...	...	...	...	...	
98	...	.....	.....	...	...	...	...	...	...	
613	...	.....	.....	...	...	...	...	...	...	
305	...	.....	.....	...	...	...	...	...	...	
82	...	.....	.....	...	...	...	...	...	...	
3,000	...	.....	.....	...	...	...	...	...	...	

STATEMENT

FOREST DEPARTMENT

STATEMENT *of Teak trees girdled and*

Name and Number of Section.	Name of Revising Officer.	Forest.	Sub-District.
IV. Sittang	W. C. Graham Esq. ...	Bimbyai	Kyoh choung ....
			Bymbyai .....
			Thaiwah .....
			Thaibyoo ....
			Tinwah .....
		Gwaythai	Kyettogwai .....
			Yaiguah .....
			Laganthay .....
			Yoonzeebine .....
			Toon Chin... ... .
		Moong	Moong ..... South ..
			Codoolo .....
			Kyouktoung Mooay.....
			Pokyaiteo ....
			Tesotah .....
			Toungyan ... ...
		Padah	Pyohzeebin .....
			Tinmacan..... .....
			Maybouk ....
			Kyouklain.....
			Tsindwintoung ... .
			Yaibootoung .....
			Total Sittang division..
V. Salween	Moung Poh O	Yoonzaleen.....	Tsekkoomoodoe .....
			Maithrolor Choungbiar ..
			Laikleesoolor Choungwah...
			Shoke choung .....
			Myatyar ditto .....
			Sinsway ditto .....
			Kwaythay ditto .....
			Ayohdoung ditto ..... .
			Nonoeboe Eng .....
			Kyetoorooay.....
	Moung Tha Nyo	Beeling	Natkyee .....
			Waigyoe .....
			Kyouktoung.....
			Mayoo .....
			Monlow.....
			Ahyoedoung .....
			Lahtoopho .....
			Kyoonbin Sakan .....
			Peingnay .....
			Total Salween division...
			GRAND TOTAL.....

II —(*Continued*)

BRITISH BURMA.

Forest Work done in season 1870-71.—(*Continued*).

Trees girdled.	First class trees estimated	Trees counted by Revising Officer.		Percentage of girdled trees counted.	Percentage of first class trees girdled	Creepers cut.	Young teak cleared.	Other trees girdled.	No. of other kinds of trees cut down.	Remarks.
		Trees girdled.	First class trees.							
205	...	.....	.....	...	...	...	...	...	...	
252	...	.....	.....	...	...	...	...	...	...	
86	...	.....	.....	...	...	...	...	...	...	
273	...	.....	.....	...	...	...	...	...	..	
108	...	.....	.....	...	...	...	...	...	...	
140	...	.....	.....	...	...	...	...	...	...	
170	...	.....	.....	...	...	...	...	...	...	
149	...	.....	.....	...	...	...	...	...	...	
190	...	.....	.....	...	...	...	...	...	...	
340	...	.....	.....	...	...	...	...	...	...	
122	...	.....	.....	...	...	...	...	...	...	
114	...	.....	.....	...	...	...	...	...	...	
161	...	.....	.....	...	...	...	...	...	...	
579	...	.....	.....	...	...	...	...	...	...	
130	...	.....	.....	...	...	...	...	...	..	
94	...	.....	.....	...	...	...	...	...	...	
230	...	.....	.....	...	...	...	...	...	...	
470	...	.....	.....	...	...	...	...	...	...	
95	...	.....	.....	...	...	...	...	...	...	
105	...	.....	.....	...	...	...	...	...	...	
105	...	.....	.....	...	...	...	...	...	...	
145	...	.....	.....	...	...	...	...	...	...	
4,263	...	.....	.....	...	...	...	...	...	...	
81	...	.....	.....	...	...	...	...	...	...	
97	...	.....	.....	...	...	...	...	...	...	
22	...	.....	.....	...	...	...	...	...	...	
153	...	.....	.....	...	...	...	...	...	...	
41	...	.....	.....	...	...	...	...	...	...	
38	...	.....	.....	...	...	...	...	...	...	
135	...	.....	.....	...	...	...	...	...	...	
124	...	.....	.....	...	...	...	...	...	...	
101	...	.....	.....	...	...	...	...	...	...	
208	...	.....	.....	...	...	...	...	...	...	
547	...	.....	.....	...	...	...	...	...	...	
70	...	.....	.....	...	...	...	...	...	...	
739	...	.....	.....	...	...	...	...	...	...	
328	...	.....	.....	...	...	...	...	...	...	
154	...	.....	.....	...	...	...	...	...	...	
54	...	.....	.....	...	...	...	...	...	...	
15	...	.....	.....	...	...	...	...	...	...	
29	...	.....	.....	...	...	...	...	...	...	
64	...	.....	.....	...	...	...	...	...	...	
3,000	...	.....	.....	...	...	...	...	...	...	
23,317	...	.....	.....	...	...	...	...	...	...	

STATEMENT III.

FOREST DEPARTMENT, BRITISH BURMA.

Statement of Timber brought from the Forests in British Burma, by Permit holders, in 1870-71.

Name and number of Section.	Name of Forest District.	Name and residence of permit holders.	Duration of Permit. From.	Duration of Permit. To.	Timber worked out. Logs.	Timber worked out. Tons.	Amount paid as purchase money for the Timber. RS.	A.	P.	Amount paid as fees for the issue of Forest Permit. RS.	A.	P.	Remarks.
II Prome East...	Boolay	Messrs. Gladstone Wyllie & Co.	1st Jany. 1868.	1st Jany. 1874.	2,315	1,713·1	10,324	..	.	.....	.	..	
	Nawing				1,210	895·4	4,586	8	0	.....	.	..	
	Matoon	Messrs. Bulloch Bros. & Co...	12th Jany. 1862.	1st Jany. 1874.	3,188	2,359·1	8,376	8	0	.....	.	.	
	Mamya		25th July 1862.		537	397·4	908	14	0	.....	.	..	
	Opho		12th Jany. 1862.		1,721	1,273·5	5,899	0	0	.....	.	.	
	Padashin... ...		Do.		1,113	823·6	1,668	14	0	.....	.	..	
	Shoaytenga	Mr. J. Bretto	1st Jany. 1871.	31st Dec. 1873.	159	117·6	699	8	0	.....	.	..	
	Bassein	Shoay Lope...	24th Mar. 1868.	1st Jany. 1874.	129	95·5	1,615	8	0	.....	.	..	
	Talaidan.....	Mr. J. Bretto	28th Feb. 1866.	31st Dec. 1871.	462	341·9	2,318	14	0	.....	.	.	
	Mudday	Said Moortaza	30th Nov. 1866.	30th Nov. 1872.	842	623·1	829	12	0	.....	.		
IV Rangoon ...	Kawleya.....	Shoay Min and Shoay Mein...	1st Sept. 1866.	1st Dec. 1871. ..	395	292·3	1,945	0	0	.....	.	.	
	Bineda	Ookiar Wine.....											
	Yainway.....	Moung Pathee and Moung Shoay Louk.....											
		Total Irrawaddy Division .	.....	.....	12,071	8,932·5	39,172	6	0	.....	...	..	

V	Sittang West.	Myohla	Burmah Company Limited	1st Dec. 1870.	1st Dec 1873.	637	471·4	4,666	0	0	2,771	10	8	
		Swah	Bombay Burmah Trading Corporation Limited	Do.	Do.	5 404	3,998·9	37 689	8	0	1.500	0	0	
		Kahboung	Ditto ditto	Do.	Do.	2.121	1,569 5	16,603	0	0	2,000	0	0	
		Hpyoo	Ditto ditto.....	30th Nov. 1868.	30th Nov 1871.	1,580	1,169 2	11,822	8	0	1,333	5	4	
		Koon	Ditto ditto	Do.	Do	829	613·5	6,554	8	0	1,000	0	0	
		Samoh	Burmah Company Limited	1st Dec. 1870.	1st Decr. 1873.	130	96 2	774	0	0	666	10	8	
VI	Sittang East.	Doonzarit	Birkarjee	30th Nov. 1868.	30th Nov. 1871.	.....	.....	.....	.		106	10	0	
		Shoaygyeen	Ditto	Do.	Do.									
		Padah	Burmah Company Limited	1st Dec. 1870.	1st Decr. 1873.	949	702 3	4,049	0	0	866	10	8	
		Moong	Subbapathee	Do.	Do.	231	170 9	706	0	0	266	10	0	
		Youkthawah	Oo Byit and Shoay Aye	Do.	Do.	408	301 9	1,963	0	0	1,167	0	0	
		Thoukyaghat	Teen Cowrie Maistry	Do	Do.	1,861	1,377 2	11.248	8	0	1,366	10	6	
		Kannee	Oo Khine	Do.	Do	1.453	1,075 2	9,793	8	0	.. .	.		
		Koonoung	Burmah Company Limited	30th Nov. 1868.	30th Nov. 1871.	2,133	1,578·4	15,271	5	0	1,666	10	8	
		Gwaythay	Mirza Mahomed Ally	Do	Do.	945	699 3	6,930	0	0	333	5	4	
		Bymbyai	Moung Koh	1st Dec. 1870.	1st Decr. 1873.	45	83 3	81	0	0	1,666	10	8	
			Total Sittang Division .	.....	..... .	18,726	13,857·2	1,28,151	13	0	16 711	14	6	
VII	Upper Salween and Beeling Forest	Beeling	Mr. C. O. Johnstone	2nd Dec. 1870.	1st Decr. 1873.	.....	.....	.....	.		.....	.	.	One-third Permit Fee. Rs 700, paid 4th April 1871.
		Upper Salween.												
		I Division	Moung Shoay Oo	1st Dec. 1865.	1st Decr. 1871.	1,393	1,030·8	8,693	0	0	.....	..	.	
		II Ditto	Moung Kyan	Do,	Do.	1,479	1,094·5	9.297	8	0	.....	.	.	
		III Ditto	Shoay Too and Poonah	Do.	Do.	2 119	1,568·0	13.941	8		.....		.	
		Yoonzaleen	Moung Oh.....	2nd Dec. 1869.	31st Decr. 1870.	1,414	1,046·4	5,286	0	0	.....	.	.	Revenue Rs 551-8 outstanding, to be collected in 1871 72
		Ditto	Mr. C. O. Johnstone	1st Jany. 1871.	31st Decr. 1873.	.....	.....	.....	.	.	.....	...	.	One third Permit Fee, Rs. 350, paid 4th April 1871
			Carried over	.....	.....	6,405	4,739 7	37,218	0	0	.....	.	.	

STATEMENT III.—(*Continued.*)

FOREST DEPARTMENT, BRITISH BURMA.

Statement of Timber brought from the Forests in British Burma by Permit holders, in 1870-71.

Name and Number of Section.	Name of Forest District.	Name and residence of permit holders.	Duration of Permit. From	Duration of Permit. To	Timber worked out. Logs.	Timber worked out. Tons.	Amount paid as purchase money for the timber. Rs.	A.	P.	Amount paid as fees for the issue of Forest Permit. Rs.	A.	P.	Remarks.
Salween division (Continued.)		Brought forward.....	.....	.....	6,405	4,739·7	37,218	..	..	.....	..	..	
VIII Thoungyeen...	Thoungyeen... ...	Messrs. Todd Findlay & Co.....	2nd Dec. 1867.	1st Decr 1870.	5,749	4,254·3	23,541	0	0	.....	..	..	Rs. 41,859 outstanding to be collected in 1871-72.
	Ditto...	Koh Tsit Poo.....	1st Feb. 1871.	31st Jany. 1872.	.....	.....	.....	..	.	.....	..	..	
IX. Lower Salween and Attaran Forests	Houndraw	Moung Pike.....	8th Dec. 1868.	7th Decr. 1871.	5	3·7	23	8	0	20	0	0	
	Doomdamee	Mr. C. O. Johnstone.....	26th April 1869.	25th April 1872.	205	151·7	1,795	8	0	.....	..	.	
	Meebo·ng	Moung Pohdoon	2nd Dec. 1867.	1st Decr. 1870.	209	154·7	959	8	0	.....	..	..	Rs. 40 outstanding, will be collected in 1871-72.
	Koloon Island ...	Koh Pandah	Do.	Do.	.....	.....	.....	..	.	.....	..	..	
	Hlineboay	Sayah Pahpoo	2nd Dec. 1870.	1st Decr. 1873.	.....	.....	.....	..	..	60	0	0	
	Mittigate Kyouktaga	Shoay Moung and 2 others	7th July 1868.	6th July 1871.	507	375·2	1,909	0	0	.....	..	..	
	Attaran Tracts. Tracts Nos. 6 & 9	Moung Oane	10th Mar. 1870.	9th Mar. 1871.	399	295·3	199	8	0	.....	..	..	
	" " 12, 13 and 14...	Mr. C. O. Johnstone..... ...	8th Mar. 1870.	7th Mar. 1871.	474	350·7	1,521	8	0	.....	..	.	
	" " 17		10th Do.	9th Do.	157	116·3	350	0	0	.....	..	..	
	" " 26, 31, 32, 36, 37, 38 and 39		Do.	Do.	196	145·0	281	8	0	.....	..	..	

Tracts Nos. 40, 41, & 42	Moh Nay	Do.	Do.	.....	.....	.....	..	.	.....			
Tracts No. 49	Moung Loogalay	1st Jany. 1869.	31st Decr. 1869.	484	358·2	543	8	0	.....			
„ „ 49	Mr. C. O. Johnstone.....	10th Mar. 1870.	9th Mar. 1871.	623	461·0	809	8	0	.....	..	.	
„ Nos. 25, 26, 27, 28, & 1 ..	Poh See and Poh-may	Do.	Do.	.....	.....	.....	..	.	.....	...	.	
Tracts Nos. 3, 4 and 5	Moung Loogalay	Do.	Do	170	125·8	85	0	0	.....	...	..	
Tracts Nos 29, 23 and 24	Moung Pan	23rd Mar. 1870.	22nd Mar. 1871	.....	.....	.....		.	.....	...	.	
Tracts Nos. 16, 17, 18, 19, 20, 21 and 22	Moung Oane	29th Mar. 1870.	28th Mar. 1871.	.....	.....	.....	..	.	.....	.	...	
Tracts Nos. 19, 20 and 21	Moung Shoay Bau	5th April 1870.	4th April 1871.	.....	.....	.....	...	.	20	0	0	
Tracts Nos, 3 and 33	Moung Loogalay	29th April 1870.	28th April 1871.	.....	.....	.....	..	..	20	0	0	
	Total	.....	.....	.....	.....	69,237	0	0	.....	..	.	
	Add Duty collected on this timber at Kadoe.....	.....	.....	.....	.....	24,906	4	0	.....	...	...	
	Total Salween Division.....	.....	.....	15,583	11,531·6	94,143	4	0	120	0	0	
	GRAND TOTAL OF THREE DIVISIONS.....	.....	.....	46,380	34,321·3	2,61,467	7	0	16,831	14	6	

Form No. 21.

FOREST DEPARTMENT, BRITISH BURMA.

Annual Summary of Revenue and Expenditure in the different Divisions during 1870-71.

Classification.	Rangoon.			Tharrawaddie.			Prome.			Total Irrawaddie Division.			Sittang Division.			Salween Division.			Kadoe Revenue Station.			Total.		
RECEIPTS.	RS.	A.	P.	RS.	A	P	RS.	A.	P	RS.	A.	P	RS.	A	P.	RS.	A.	P	RS.	A.	P	RS.	A.	P
I.—Sale of Timber at Depôts	3,36,626	9	1	14,479	13	1	517	6	4	3,51,623	12	6	.....	..	.	.....	..	.	.....	.	.	3,51,623	12	6
II.—Sale of Timber removed by Purchasers ...	1,945	0	0	.....	..	.	37,227	6	0	39,172	6	0	1,28,151	13	0	69,237	0	0	24,906	4	0	2,61,467	7	0
III.—Duty on Foreign Timber	.....	.	..	.....	.	.	.....	.	.	.....	.	.	.....	.	.	.....		.	1,49,956	9	0	1,49,956	9	0
IV.—Permit Fees	.....	.	.	.....	.	.	.....	.	.	.....	.	..	16,711	14	6	120	0	0	.....	.	.	16,831	14	6
V.—Grazing dues	.....	..	..	.....	.	.	.....	..	.	.....	.	.	.....	.	.	.....	.	.	.....	.	.	.....	.	.
VI.—Sale of Fruits, &c.	.....	.	.	.....	.	.	.....	..	.	.....	.	..	.....		.	.....		.	.....	.	.	.....	.	.
VII,—Sale of Confiscated drift & waif timber ..	.....	.	.	506	8	0	.....	.		506	8	0	80	11	0	2,022	3	0	7,363	14	0	9,973	4	0
VIII.—Fines and Forfeitures	225	0	0	65	0	0	112	14	0	402	14	0	54	0	0	968	0	0	.....	.	.	1,424	14	0
IX —Miscellaneous Receipts	1,834	7	0	15,899	15	0	108	8	0	17,842	14	0	2,755	0	0	643	2	0	5,605	7	0	26,846	7	0
Total Receipts	3,40,631	0	1	30,951	4	1	37,966	2	4	4,09,548	6	6	1,47,753	6	6	72,990	5	0	1,87,832	2	0	8,18,124	4	0

A. CONSERVANCY AND WORKING.																								
I.—Timber expenses...	76,071	10	6	1,13,334	9	3	323	2	0	1,89,729	5	9	2,195	12	0	795	11	0	7,866	4	0	2,00,587	0	9
II.—Purchase of Stock	16,907	8	0	3,570	0	0	154	1	0	20,631	9	0	188	8	0	22	0	0	123	8	0	20,965	9	0
III.—Feed and Keep of Cattle	7,522	3	0	1,665	15	9	1,732	10	11	10,920	13	8	523	3	0	.....	..	..	.....	..	..	11,444	0	8
IV.—Rent of leased forests	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..
V.—Charges on collecting revenue on grass, &c.	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....		..	.....	..	..
VI.—Plantations...	12,587	5	0	6.558	1	0	99	0	0	19,244	6	0	11,032	6	10	5	0	0	.....	..	..	30,281	12	10
VII.—Forest Work	758	15	0	1,149	9	4	1,038	7	0	2,946	15	4	961	8	0	868	3	0	.....	..	..	4,776	10	4
VIII.—Forest Survey	2,161	9	0	1,807	13	6	10,610	5	0	14,579	11	6	1,107	0	0	9	0	0	.....			15,695	11	6
IX.—Experiments on Timber	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..	.....	..	..
X.—Communications and Buildings	3,733	15	0	1,267	15	0	139	8	0	5,141	6	0	294	10	0	.....	..	..	282	0	0	5,718	0	0
TOTAL CONSERVANCY AND WORKING.....	1,19,743	1	6	1,29,353	15	10	14,097	1	11	2,63,194	3	3	16,302	15	10	1,699	14	0	8,271	12	0	2,89,468	13	1
B, ESTABLISHMENTS,																								
I.—Salaries	39,102	10	0	14,293	3	4	12,478	13	4	65,874	10	8	14,192	6	2	11,314	6	0	6,048	0	0	97,429	0	10
II.—Allowances	3,382	10	0	2,300	7	0	392	0	0	6,075	1	0	1,216	5	4	1,172	0	0	.....	..	..	8,463	6	4
III.—Contingencies	2,058	4	0	220	3	6	671	5	8	2,949	13	2	105	10	0	736	15	0	397	12	0	4,190	2	2
IV.—Official Postage	467	14	4	5	4	6	2	4	6	475	7	4	7	12	0	.....	8	0	.....	.		483	1[illegible]	4
TOTAL ESTABLISHMENTS.....	45,011	6	4	16,819	2	4	13,544	7	6	75,375	0	2	15,522	1	6	13,223	13	0	6,445	12	0	1,10,566	10	8
GRAND TOTAL EXPENDITURE.....	1,64,754	7	10	1,46,173	2	2	27,641	9	5	3,38,569	3	5	31,825	1	4	14,923	11	0	14,717	8	0	4,00,035	7	9

Form No. 22.

FOREST DEPARTMENT, BRITISH BURMA.

Annual Abstract Cash Account of the Cash Transactions of the Forest Department British Burma, for the Official Year 1870-71.

Year	Heads of Accounts.	Rupees. RS.	A	P	Year.	Heads of Accounts.	Rupees. RS	A	P
1870-71.	To Cash Balance in hand on 1st April 1870	7,724	15	0	1870-71	By Expenditure of the Department	4,00,035	7	9
	„ Revenue realized	8,18,124	4	0		„ Remittances of State Treasuries	7,84,466	7	3
	„ Income Tax	2,624	13	9		„ Ditto. on account of Public Department	20,425	9	3
	„ Remittances from State Treasuries	3,84,571	1	5		„ Ditto on account of other Offices	695	5	8
	„ Ditto „ Uncov · Civil Pension Fund	468	0	0		„ Repayments of Deposits	7,210	14	10
	„ Ditto „ Military Fund	303	7	7		„ Advances Recoverable	8,913	5	10
	„ Deposits	9,397	6	7		„ Allowances, Refunds, and Drawbacks	113	6	0
	„ Advances Recoverable	10,623	11	2		„ Cash Balance on 31st March 1871	11,977	3	3
	GRAND TOTAL RUPEES	12,33,837	11	10		GRAND TOTAL RUPEES ..	12,33,837	11	10

Form No. 23.

FOREST DEPARTMENT, BRITISH BURMA.

Annual Statement of Outstandings and Liabilities of the Department on Account of Contractors and Disbursers, 1870-71.

Name and number of Divisions.	Department Debtor.									Department Creditor.									Balance due.					
	At Commencement of the year.			Recoveries in cash and value of supplies and work done during the year.			At Close of the year.			At commencement of the year.			Payments made during the year.			At close of the year.			To Department, outstandings.			By Department, Liabilities.		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
Tharrawaddee	.....	...	...	1,14,941	8	6	1,14,941	8	6	2,10,221	1	0	1,10,585	9	0	3,20,806	10	0	2,05,865	1	6	.....	...	...
Rangoon	.....	...	...	51,963	11	8	51,963	11	8	49,445	5	4	61,887	8	0	1,11,332	13	4	59,369	1	8	.....	...	...
Prome	.....	...	...	763	7	0	763	7	0	80	8	0	1,686	9	10	1.767	1	10	1,003	10	10	.....	...	...
Sittang	.....	...	...	1,036	0	0	1,036	0	0	736	10	0	1,020	0	0	1,756	10	0	720	10	0	.....	...	...
Salween	.....	...	...	1,119	4	0	1,119	4	0	99	4	0	1,078	0	0	1,177	4	0	58	0	0	.....	...	...
Kadoe Revenue Station ...	.....	...	...	379	12	0	379	12	0	378	12	0	1	0	0	379	12	0	.....	...	...	.....	...	...
Grand Total Rupees.....	.....	...	...	1,70,203	11	2	1,70,203	11	2	2,60,961	8	4	1,76.258	10	10	4,37,220	3	2	2,67,016	8	.	.....	...	...

Form

FOREST DEPARTMENT,

Statement of Timber brought from the Forest

Name and number of Division.	Name of Forest.	Round Logs.				
		Yatthits.	Loozars.	Doogies.	Yard and mast pieces.	Crooks.
	Average cubical contents in cubic feet.	(26)	(48)	(58)	(90)	(12)
Tharrawaddie ...	Beeling	353	846	426	1	...
	Mokkah	520	689	303	...	1
	Minlha	706	386	196	..	...
	Gamoung	158	547	495	4	...
	Toung Choung	183	169	80	8	...
	Boien	358	1,574	1,605	5	...
	Shaboung	18	95	158	3	...
	Shooaylay	17	433	342	...	..
	Mimboo	47	455	100	2	...
	Toungnyo	446	1,469	1,362	36	...
	Ngapeeing	247	37	17	..	...
	Padingben	2	16	9	...	...
	Htoon	29	9	10	...	...
	Logs ...	3,084	6,725	5,103	59	1
	Tons ..	1,603·7	6,456	5,919·5	106·2	·2
Southern or Rangoon	Pegu	182	95	1,446	53	...
	Oakkan	22	127	50	...	...
	Zamayee	56	222	1,608	82	...
	Thoungzai	10	69	93	...	...
	Pounglin	28	290	129	...	...
	Magayee	.....	23	27	...	...
	Logs ..	298	826	3,353	135	...
	Tons ..	154·9	792·9	3,889·5	213	...
Drift Timber ...	Obtained from various sources ...	7	22	63	...	...
	Drift Timber { Irrawaddie Division	118	207	267	...	...
	Drift Timber { Sittang "	.....	25	548	...	..
	Drift Timber { Salween "	331	518	707	1	175
	Sea-shore Timber...	96	236	171	...	4
	Logs ..	552	1,008	1,756	1	179
	Tons ..	287	967 7	2,036·9	1·8	42 9
	Total of Logs ...	3,934	8,559	10,212	195	180
	Total of Tons ...	2,045·6	8,216·6	11,845·9	351	43 1

No. 24

BRITISH BURMA.

by Contractors and Government Agency in 1870-71.

Square Logs.						Remarks.
Squares.	Planks and Shin-byns.	Sleepers.	Small pieces.	Logs.	Tons.	
(48)	(8)	(3·5)	(7)	.....	.....	
.....	.....	507	21	2,154	1,530·2	
.....	.....	292	21	1,826	1,306·9	
2	.....	223	69	1,582	992·2	
2	.....	.....	63	1,269	1,199·5	
.....	.....	708	31	1,179	418·5	
.....	.....	.....	1	3,543	3,568·2	
.....	.....	.....	.....	274	289·2	
.....	.....	.....	.....	792	821·2	
.....	.....	.....	.....	604	580·8	
2	.....	675	3	3,993	3,336·4	
.....	.....	.....	5	306	184·4	
.....	.....	307	.....	334	48·3	
2	.....	.....	.....	50	37·2	
8	.....	2.712	214	17,906	.....	
7·7	.....	189·8	29·9	.....	14,313·0	
.....	.....	.....	.....	1,776	1,958·5	
1	.....	.....	27	227	196 1	
.....	.....	.....	.....	1,968	2,255·1	
.....	.....	.....	3	175	179 7	
.....	.....	.....	.....	447	442·6	
.....	.....	.....	.....	50	53·4	
1	.....	.....	30	4,643	.....	
·9	.....	.....	4·2	.....	5,085·4	
2	.....	.....	.....	94	99 7	
.....	.....	.....	36	628	574·8	
.....	.....	.....	26	599	663 3	
5	.....	.....	.....	1,737	1,538·1	
16	.....	.....	.....	523	491·1	
23	.....	.....	62	3,581	.....	
22	.....	.....	8·7	.....	3,367·0	
32	.....	2,712	306	26,130	.....	
30 6	.....	189·8	42 8	.....	22,765·4	

Form No 25

FOREST DEPARTMENT, BRITISH BURMA.

Statement of Timber received and disposed of from the Forests in British Burma, by the Forest Department, from 1st April 1870, to 31st March 1871.

Particulars.	No.	Total.
Number of Logs in hand on 31st March 1870	.....	33,553
Do. of logs brought from the Forests by the Forest Contractors and Government Agency :—		
Logs	19,837	
Sleepers	2,712	
Drift timber collected at Depôts	3,581	
Total as exhibited in Statement III .	.....	26,130
Number of Logs brought from the Forests by permit holders .—		
Prome East and West	11,676	
Rangoon	395	
Sittang	18,726	
Salween	15,583	
Total as exhibited in Statement IV .	.....	46,380
Kadoe Timber Revenue Station.		
Number of Logs registered for duty of Season 1870-71	92,007	92,007
Total number of Logs...	.....	1,98,070

Particulars.	No.	Total.
Number of Logs sold in 1870-71 as per Form No. 26	14,207	14.207
Do. of Logs sold by permit holders in 1870-71	46,380	46,380
Drift timber delivered to claimants on proof of ownership	1,942	1,942
Number of Logs expended for Government purposes	271	271
Number of Logs lost or perished during the year	14	14
Kadoe Timber Revenue Station.		
Number of Logs cleared on payment of duty in 1870-71	71,168	71,168
By balance on 31st March 1871	... .	64,088
Total number of Logs .	... .	1,98,070

Form No. 26.

FOREST DEPARTMENT, BRITISH BURMA.

Statement shewing the amount realized on account of different classes of timber received on Government account and sold during 1870-71.

PARTICULARS.	No. of Logs.	Cubical contents.	Amount realized.			Average amount realized per log.			Average cubical contents per log.	Average amount realized per ton		
			RS.	A.	P.	RS.	A.	P.		RS.	A.	P.
Round Logs ... ... Yatthits	1,908	45,792	12,107	10	8	6	5	6	24	13	7	..
Loozars	3,852	2,08,008	77,386	..	...	20	...	..	54	18	9	7
Doogies	6,274	4,45,454	2,28,424	5	6	36	6	6	71	25	10	[illegible]
Yard, mast, keel, and stem-pieces	88	8,712	4,691	10	4	53	5	1	99	26	14	10
Squares ... ... Doos, doodoos, and thokes	.....	.....	.....	...	..	.....	...	.	.....	.....	..	.
Shinbyns	.....	.....	.....	..	...	.....	...	..	.....	.....	.	.
Small Pieces ... . Crooks	1,187	14,244	7,112	...	...	5	15	10	12	24	4	2
Small Pieces	44	352	187	11	..	4	4	4	8	26	11	[illegible]
Woods of other kinds	.....	.....	.....	..	..	.....	..	...	.....	.....	.	.
Total Logs.....	13,353	7,22,562	3,29,909	5	6	24	12	..	.....	22	13	3
Sleepers ... ... Teak	.....	.....	.....	...	.	.....	.	..	.....	.....	...	...
Pynkadoe...	150	320	300	..	.	2	...	...	2·08	46	14	..
Total Sleepers.....	150	320	300	..	.	2	.	..	2 08	46	14	.
Confiscated Drift and Waif Timber	704	32,384	7,363	14	..	10	7	..	46	11	6	...
GRAND TOTAL.....	14,207	7,55,266	3,37,573	3	6	23	12	2	.....	22	5	7

	RS.	A.	P.
Realized under Head I of Revenue	3,51,623	12	6
Do. Do. VII „	9,973	4	.
	3,61,597	..	6
Deduct on account of sale of 1869-70, realized in 1870-71	26,759	13	
	3,34,837	3	6
Add on account of sale of 1870-71, to be realized in 1871-72	2,736	...	.
Total of sales of 1870-71.....	3,37,573	3	6

Form No. 27.

FOREST DEPARTMENT, BRITISH BURMA.

Statement shewing the amount expended on account of the different classes of Timber received on Government account during 1870-71.

Particulars.	Number of Logs.	Cubical contents.	Amount paid to Contractors.			Average amount paid per Log.			Average cubical contents ⅌ log	Average amount per ton.			Remarks
			RS.	A.	P.	RS.	A.	P.		RS.	A.	P.	
Round Logs: Yatthits	3,382	87.932	14.163	6	0	4	3	0	26	8	8	0	
Round Logs: Loozars	7,551	3.62 448	55.216	11	0	7	5	0	48	7	10	0	
Round Logs: Doogies	8,456	4,90,448	85,617	0	0	10	2	0	58	8	12	0	
Round Logs: Yard, mast, keel, and stem pieces	194	17,460	3,673	14	0	18	15	0	90	10	9	0	
Squares: Squares	9	432	192	6	0	21	6	0	48	22	4	0	
Squares: Shinbyns and planks	.....	.....	.....	..	.	.....	..		.....	.....	.	.	
Small pieces: Crooks	1	12	4	8	0	4	8	0	12	16	11	0	
Small pieces: Small pieces	244	1,708	381	4	0	1	9	0	7	11	2	0	
Total brought out by Contractors	19,837	9,60.440	1,59,219	1	0	8	0	6	.....	8	5	0	
Total of sleepers from Tharrawaddie	2,712	9,492	5,085	0	0	1	14	0	3·5	26	13	0	
Drift timber by Government Agency	3,581	1,68,350	13,461	1	0	3	12	0	47	4	15	0	
Total paid for year's outturn as per Statement III	26,130	11,38,282	1,77,795	2	0	6	12	0	.....	7	12	0	
Add expenditure incurred in 1869-70 to account of operations in 1870-71 inclusive of timber neaped in the Meimakha	.....	.....	68,450	0	0	2	10	0	.....	3	0	0	
Add cost of administration, direction, and other expenditure, chargeable to timber brought to Depôts	.....	.....	81,777	8	0	3	2	0	.....	3	9	0	
I. Total expenditure on Government timber of season 1870-71	.....	.....	3,28,022	10	0	12	8	0	.....	14	5	0	
Deduct expenditure of 1869-70 included above to exhibit actual cost of Timber	.....	.....	68,450	0	0	.....	..	.	.....	.....	.	.	
			2,59,572	10	0								
II. Do. chargeable to 46,380 Logs Permit timber	.....	.....	81,890	5	9	.....	.	.	.....	.....	.	.	
III. Do. do. to Kadoe Revenue Station	.....	.....	14,717	8	0	.....	.	.	.....	.....	..		
IV. Amount of part payments in 1870-71 to account of timber operations of 1871-72	.....	.....	43,855	0	0	.....	...	.	.....	.....	.	.	
Total expenditure of the department on account of this year	.....	.....	4,00,035	7	9	.....	.	.	.....	.....	.	.	

Form No. 28.

FOREST DEPARTMENT, BRITISH BURMA.

Annual Account of Forest Revenue for the year 1870-71.

	RS.	A.	P.
Receipts	8,18,124	4	0
Expenditure	4,00,035	7	9
SURPLUS.....	4,18,088	12	3
Add difference between Assets and Liabilities at the commencement and close of the year	1,10,563	2	8
NET REVENUE.....	5,28,651	14	11

Detail of difference between Assets and Liabilities at the commencement and close of the year:

	At the commencement of the year.			At the close of the year.			DIFFERENCE. In favor of the year.			DIFFERENCE. Against the year.		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
Value of Timber and other stock ...	1,52,562	0	0	2,64,897	0	0	1,12,335	0	0	...	..	..
Outstanding on account of sales, and excess payments to contractors..	3,16,524	13	4	3,14,753	0	0	.....	..	.	1,771	13	4
TOTAL ASSETS...	4,69,086	13	4	5,79,650	0	0	1,12,335	0	0	1,771	13	4
Deduct Liabilities...	.....	...	..	.....	.	.	.....	..	...	...	..	...
BALANCE...	4,69,086	13	4	5,79,650	0	0	1,12,335	0	0	1,771	13	4
							1,10,563	2	8	...	...	...
	1869-70			1870-71								
Outstandings of Contractors.....	2,60,961	8	4	2,67,016	8	0	.....	.	.	...	...	...
Do. Sales.....	26,759	13	0	2,736	0	0	.....	...	...	...	...	...
Do. Permit Holders ...	28,803	8	0	45,000	8	0	.....	...	...	...	...	...
	3,16,524	13	4	3,14,753	0	0	.....	..	...	...	...	...

APPENDIX

FOREST DEPARTMENT,

Statement exhibiting outlay of the Department in the purchase of Elephants for to 1870-71, also exhibiting recoveries effected, Interest

Years	Number of animals purchased.	Total amount paid.			Average cost per animal.			Number loaned to contractors.	Value.			Number returned for Government carriage purposes.	Value.			Number of animals resumed for non-payment.	Value.		
		Rs.	A	P	Rs.	A	P		Rs.	A	P		Rs.	A.	P		Rs.	A.	P
Balance at close of 1860-61	59	51,625	0	0	875	0	0	...	.....	.		...	.....	.	.	...	...	.	.
1861 62	8	10,200	0	0	1,275	0	0	...	.....	.	.	61	57,460	0	0	...	...	.	.
1862-63	...	.....			.....	.	.	...	.....	.	.	52	49,725	0	0	...	...	.	.
1863-64	1	1,200	0	0	1200	0	0	26	29,550	0	0	22	20,173	0	0	1	1,200	0	0
1864-65	4	3,896	0	0	974	0	0	...	.....	.	.	37	34,025	0	0	...	...	.	.
1865-66	18	15,372	0	0	854	0	0	17	19,839	0	0	16	14,180	0	0	...	...	.	.
1866-67	17	19.125	0	0	1,125	0	0	26	30,030	0	0	18	15,597	0	0	...	...	.	.
1867-68	26	23,200	0	0	892	0	0	36	33,300	0	0	17	14,255	0	0	...	...	.	.
1868-69	42	40,530	0	0	965	0	0	31	29,667	0	0	21	19,222	0	0	...	...	.	.
1869-70	10	8,750	0	0	875	0	0	5	4,875	0	0	25	23,479	0	0	...	...	.	..
1870-71	52	47,580	0	0	915	0	0	79	67,037	0	0	32	31,510	0	0	6	6,690	0	0
Total..	237	2,21,478	0	0	934	0	0	220	2,14,298	0	0	301	2,79,620	0	0	7	7,890	0	0

A.

BRITISH BURMA.

the outturn of timber by Contractors and Government Agency from 1861-62. *collected, and deaths and other casualties recorded.*

Number of animals paid by for contractors.	Value			Amount of Interest collected.			Number of animals lost by deaths and other casualties.	Value.			Number of animals sold	Sum obtained.			REMARKS.
	RS	A	P	RS.	A.	P		RS.	A	P		RS.	A	P	
...	..			.....	.	.	.....	.....	.	.	...	.....	.		
...	.. .		.	.....	..		14	12,800	0	0	...	.....	.		
..	.....	.		.....	.	.	2	1,824	0	0	...	.....	.	.	79 32 Total 111
...	.....	.	.	.....		.	3	2,539	0	0	4	889	0	0	
8	7,336	0	0	.....	.	.	6	5,650	0	0	1	305	0	0	
15	18,845	0	0	.....	.		6	5 430	0	0	...	.....	.	.	1870-71. ABSTRACT OF BALANCE. Number of animals to be paid for by contractors Number retained for Government purposes..
...	.....	.		.....	.	.	7	6,705	0	0	...	.....	.	.	
3	3,465	0	0	1,263	11	0	12	11,892	0	0	...	.....			
1	1.132	0	0	634	10	0	6	6,570	0	0	...	.....	.	.	
2	2,272	0	0	490	0	0	5	4,530	0	0	...	.....			
6	5,502	0	0	2,566	14	0	16	11,864	0	0	2	855	0	0	
35	38,552	0	0	4,955	3	0	77	69,804	0	0	7	2,049	0	0	

APPENDIX B.

Statement exhibiting cost of feed and keep of Elephants of the Forest Department British Burma, for the official year 1870-71 *as compared with that of the Commissariat Department for the same period.*

Division.	Number of Elephants kept.	Total cost of feed for the year.			Total cost of keep for the year.			Amount paid for medicines.			Amount paid for gear.			Total expenditure per annum.			Average cost for each animal per annum,			Average cost of a Commissariat Elephant for 1870-71.			Average cost per animal of the Forest Department per mensem			Average cost per animal of the Commissariat Department per mensem.			Value of labor in cash receipts and work performed			Remarks.
		RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	RS	A.	P.	RS.	A.	P.	RS.	A.	P	RS.	A.	P.	RS.	A.	P.	RS.	A.	P	LS.	A.	P	
Rangoon	12	3,415	12	0	3,280	5	5	202	6	...	203	...	..	7,101	7	5	591	12	7	564-14-8	...	.	49	5	0	47-1-2⅔	..	.	7,145	5	0	The keep of the Elephants of the Forest Department per monsem for each animal is Rs. 24. In the Commissariat Department it is Rs. 21. If it were possible to engage men to work in the forests at this latter rate the cost would be Rs 3 per mensem less per animal.
Prome...	6	614	11	6	1,728	...	...	10	...	...	330	...	..	2,682	11	6	447	1	11		...	...	37	4	2		..	..	5,868	.	.	
Sittang	2	.....	...	...	576	..	...	16	...	...	110	.	..	702	.	.	351	...	.		..	...	29	4	0		..	...	26	4	0	
Tharrawaddie ..	5	132	5	9	1,440	.	...	28	8	0	275	.	...	1,875	13	9	375	2	9		...	.	31	4	3		...	...	2,796	4	0	
Salween	...	.....	...	...	.....	..	..	.....	...	...	.....	...	.	.....	..	.	.....	...	.	.....	...	...	.....	...	...	.....	...	..	.....	.	.	
Total...	25	4,162	13	3	7,024	5	5	256	14	0	918	..		12,362	0	8	1,765	1	3	564	14	8	41	3	3	47	12⅔		15,835	13	0	

APPENDIX C.

Comparative Statement shewing the burdens which Foreign and British Timber have to bear before they reach a Port of Shipment.

Division and Nature of Charges.	Charges.			Royalty.			Import.			Export.			Total.		
	RS.	A.	P.	RS.	A	P.	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
Foreign.															
Kerennee and Shan Forests.															
Price paid for logs launched into the water including Royalty to Chief Rs 10 to 35 according to quality, average say	25	0	0												
Rafting charges from Kyodan to Kadoe per log	4	0	0												
Import duty at Kadoe per log	...	.	..	...	..	.	2	12	0						
Rafting charges Kadoe to Maulmain per log	...	4	0												
Cost per log of ordinary good timber laid down in Maulmain	...	..	..	...	.	.	...	..	..	...	..	..	32	0	0
Ningyan Forest.															
Royalty to the King of Burmah depending upon special agreement and according to quality of logs, but say for an ordinary doogie of good quality	...	.	.	7	0	0									
Expenses of felling, dragging, and launching per log	15	0	0												
Rafting charges from Ningyan to Tonghoo per log say	2	8	0												
Rrafting charges from Tonghoo to Rangoon per log say	3	12	0												
Cost per log of ordinary doogies of good quality laid down in Rangoon	...	.	.	...	.	..	...	..	..	...	..	..	28	4	0
Mandalay Forests.															
Royalty to the King depending upon special arrangement, and according to quality of logs, but say for ordinary doogies of good quality	...	..	.	7	0	0									
Expenses of felling, dragging and launching per log say	15	0	0												
Rafting charges from Ava to Rangoon per log	3	0	0												
Cost per log of an ordinary doogie laid down in Rangoon	...	.	.	...	..	.	...	.	..	...	..	.	25	0	0
British.															
Prome Permit timber	20	0	0	7	0	0	...	..	..	...	..	.	27	0	0
Sittang ditto	20	0	0	7	0	0	...	..	.	...	..	..	27	0	0
Salween ditto	18	0	0	7	0	0									
				2	12	0		And Kadoe.					27	12	0
Tharrawaddie worked by Government Contractors	15	0	0	...	..	..							15	0	0

Note The rates exhibited for the Ningyan Forests have recently been revised but do not come into operation till November 1871, they will therefore appear in next year's statement.

ERRATA.

Page 10, para. 60, line 8 : For "1,015" trees (girdled in Gwaythay in 1869-70), *read* 989.

" " " " 9 : For "1,014" trees (girdled in Bimbyay in 1869-70), *read* 924.

" " " " 13 : For "5,029" (total trees girdled in 1869-70), *read* 4,913.

" " " " 14 : For "Thus 23,433 trees," *read* Thus 23,31 trees.

" 24 " 180, last line : For "9,000 tons," *read* 6,000 tons.

APPEDNIX S.

PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

PROVINCE OF MYSORE,

1870—71.

By LIEUT. G. J. VAN SOMEREN,

CONSERVATOR OF FORESTS.

REVIEW BY THE CHIEF COMMISSIONER.

The Progress Report of the Mysore Forests for 1870—71, has been prepared by the Conservator, Lieutenant van Someren.

2. The report has been drawn up in general accordance with the instructions laid down in Circular No. 18 Forests, dated 4th November 1868; and the several headings adopted in it will be followed in these remarks.

INTRODUCTORY.

3. The addition to the Forest Rules empowering Amildars to dispose of minor forest offences, which was sanctioned by the Government of India during the past year, has removed a source of inconvenience previously much felt.

SPECIAL.

HEAD 1.—STATE FORESTS AND FORESTS LEASED BY THE STATE.

FIRST SECTION.

4. Eight new forests with an aggregate area of about 50 square miles, were added to the list of State forests during the past year; and fair progress was made in their demarcation. All these forests promise to be suitable for the purpose for which they have been selected.

5. The total area of the tracts set apart for State forests in Mysore up to the close of last year, was about 398 square miles, of which 353 consisted of deciduous, and 45 of evergreen forests. Of the former class, 247 square miles have been demarcated. The boundaries of the whole of the evergreen forests are naturally marked.

SECOND SECTION.

6. No remarks called for.

THIRD SECTION.

Protection of the Forests.

7. The precautions adopted to keep fires out of certain forests named, are stated to have been successful.

8. There were eighty two cases of breach of the Forest Rules reported during the year; in forty five of which the accused parties were convicted and punished. In fifteen, the accused were acquitted, and twenty-two cases were pending at the close of the year. It is observed that the disposal of the cases occurring in the Ashtagram Division, appears to be unsatisfactory, only three convictions having been obtained out of eleven cases brought to trial, while nineteen remain still pending.

FOURTH SECTION.

Improvement and Extension of the Forests.

9. The measured work in demarcating and clearing the State forests during the year, aggregated—

	Miles.
New demarcation	20
Compartment lines	41
Clearing old lines	55

This does not include the demarcation of the Dévaráyadroog forest, which, though completed, was not measured up at the close of the year.

Plantations.

10. The following plantations are mentioned in the report as having been more or less completed, or being under preparation for stocking.

11. *In the Nagar Range* the Lakkuvalli teak plantation has been completed. The extension of this plantation is much desired by the Conservator; but the project of the Madras Irrigation Company, which, if carried out, will swamp all the land suitable for the purpose, prevents anything being done with this object. The time has perhaps arrived, when the rights and requirements of the Mysore State in this matter, should be considered, in view to the final disposal of this question.

The Vittalamallappana Kanavé teak plantation was completed. These two plantations cover 35 acres.

An experimental plantation was opened in the newly selected State forest in the Jágar valley.

Sandalwood Reserves.—The reserve at Shimoga has been resown, and promises well. Two other reserves of 250 acres each, have been selected and prepared for sowing during the current year.

12. *In the Ashtagram Range* two plots of 100 acres each, have been cleared and sown with teak seeds, which have germinated well.

Sandalwood Reserves.—A reserve, 250 acres in extent, was sown, and the seeds germinated freely; but a fire which swept through it at the close of the year, has done great damage to the young seedlings.

The commencement of a fuel plantation near Hassan was taken in hand; and it is intended to extend it to 250 acres.

Various sites for sandal-reserves were selected in the Hassan District by the Conservator; but the local Forest Officer has not yet been able to enclose and prepare them for the purpose.

13. *In the Nandidroog Range* a plantation has been formed in a sheltered valley in the Dévaráyadroog State forest, in which trees of various sorts have been planted, including some teak. Bamboos and babúl trees have also been sown in suitable plots on this plantation, which promises to succeed.

Sandalwood Reserves.—A large tract, 610 acres in extent, was selected and prepared for sandal sowings, and will it is hoped, be sown during the present season. Another plot of 450 acres has also been made over to the Department for this purpose, for which it is also intended to set apart a portion of a fuel plantation at Hosaharidé. Large quantities of sandal seed have been collected for sowing the above and other reserves, and also for being used in favorable localities in the State forests generally.

14. Railway fuel plantations.—Six tracts of land aggregating 4,270 acres were selected and made over to the Forest Department in August 1870, for the purpose of being planted up; and fair progress was made in their enclosure and preparation with this object.

The Jadigénahalli Plantation—395 acres in extent, has suffered some loss of seedlings, but promises to succeed.

15. The experiments with the Eucalypti have not yet been satisfactory; but the Conservator believes they will succeed in parts of the Province; and fresh efforts will be made to introduce and establish this valuable class of timber, which from its remarkably rapid growth, where the climate and soil are favorable, would be just what is needed for Mysore. It is doubtful if some of the seeds of this class of trees, that has been received and sown, was not spoilt before its arrival.

16. A large quantity of seeds suitable for fuel plantations was collected during the year, and is now being utilized.

FIFTH SECTION.

Actual yield of Forests, disposal of timber, &c.

17. *In the Nagar Range* the fellings amounted to 1,566 teak logs and poles, and 1,037 jungle logs. The sales at the depôts amounted to Rs. 64,772. The collections of sandalwood amounted to 297 tons of good wood, and 87¼ tons of waste and useless pieces. Of the former, 232¼ tons were sold at an average rate of Rs. 306—11—0 per ton, the cost of collection being Rs. 44—4—8.

18. *In the Ashtagram Range* the fellings amounted to 7,593 cubic feet, and 4,609 pieces and poles of Teak; and 20,162 cubic feet, and 2,232 poles of Jungle wood.

The sales at the depôts amounted to Rs 17,553. The collection of sandalwood aggregated 378¾ tons; of which 332¾ tons of good, and 31 tons of inferior quality, were sold; the former realizing Rs. 342—6—4 per ton, while the cost of collection was Rs. 43—8—0.

19. *In the Nandidroog Range* there were no fellings.

The collections of sandal aggregated 117¾ tons. The sales were 85½ tons good, and 23¾ indifferent wood. The former realized Rs. 378—14—4 per ton, while the cost of collection was Rs. 38—15—0.

20. The rates generally realized on the sandal sales were satisfactory. They were highest in the Nandidroog Division; which is ascribed by the Conservator, to the facilities to purchasers afforded at Bangalore where the sales are held, by the railway, and other advantages of its position.

21. The questions connected with the District forests and the best mode of bringing them under systematic control and conservation, instead of leaving them to be wholly cleared off under the operation of the license system, which has already ruined by far the larger number of them, has received much consideration during the past year. The Conservator has consistently urged that no permanent results can be effected, unless the forests are placed under the Forest Department; but his views were for some time opposed by some of the Revenue Officers, who thought it preferable that the measures decided on, should be carried out by themselves. All, however, have at length come round to the opinion, that, to give any general scheme for the re-establishment and control of this class of forests, (on the proper working of which the comfort and convenience of the people so much depend) a fair chance of success, it is necessary that they be placed under the supervision of the Forest Department, which can alone initiate the measures required with the above object; and a project is now being prepared by the Conservator in communication with the Revenue Officers, which will it is hoped, provide suitably for the several points aimed at; and which will be submitted for the orders of the Government of India, when complete. In anticipation of the adoption of this measure, a general inspection of some of the principal District forests has been made by the Conservator and his Assistants, in company with the local Revenue Officers; and suitable tracts have been selected for demarcation for the purpose.

22. The portions of the Western Ghâts' forests in Manjarábád, deemed suitable for Cardamom cultivation, were examined by Mr. King, Sub-Assistant Conservator; and it is proposed to allot them on leases for 20 years, in plots not exceeding 200 acres each. It is however doubtful if this valuable article cannot be successfully cultivated on other sites than those heretofore believed to be alone fit for the purpose; and if this prove to be the case, its cultivation will probably be greatly extended.

GENERAL.

HEAD I.—FINANCIAL RESULTS.

23. The financial results of 1870—71 may be thus summarized.

I. The year opened with assets valued at Rs. 1,87,600

Timber, &c., in stock ...	... 1,75,262	
Outstandings due ...	... 12,338	
	Total Rs, 1,87,600	

II. Receipts during the year—

From sale of timber of all kinds	.. 3,26,563	
Minor forests produce. ...	... 11,106	
		3,37,669
Expenditure under all heads ..	..	1,45,443
Leaves Balance surplus, ..	..	Rs. 1,92,226

Receipts in cash.

III. Assets at close of the year, Rs. 2,54,311, or Rs. 66,711 in excess of those with which the year opened.

Value of timber, &c., in stock.		... 2,28,371
Outstandings on account of—		
Contractors ...	15,352	.. 28,072
Do Sales	12,720	
	Total	2,56,443
Less liability for refunds		2,132
		Rs. 2,54,311

The operations of the year thus shew a net profit of Rs. 2,58,937, of which Rs. 1,92,226 was realized in cash.

24. In paras 59 to 71 of the Conservator's report, full details are given of the actuals for the year under the several sub-heads of receipt and expenditure, as compared with the Budget allotments, which appear to be sufficiently explanatory.

25. The short sales of timber at Mysore have diminished the anticipated receipts from this source by Rs. 12,000. During the latter period of his holding charge of the Ashtagram Range, the Assistant Conservator, Mr. Ludlow, was unequal from ill health, to the energetic performance of his duties; and certain measures, which it was expected would add to the forest revenues, were neglected. The provision made for establishing fuel-plantations and sandal-reserves in this range, was, from the same cause, but little utilized.

26. In the Nandidroog Range, the short collection of sandal-wood caused a falling off in the estimated receipts of Rs. 9,000. The Conservator explains that this was due to the unsatisfactory arrangements for the charge of the range, and the inexperience of the Officers who held it successively.

The other items do not appear to call for special remark.

GENERAL REMARKS.

Comtemplated Operations.

27. These, under the orders of the Government of India on the Budget, will be limited to the felling of,—

I. Teak, 20,000 cubic feet and 2,000 poles,

II. Jungle-wood, 80,000 feet and 500 cart-loads,

III. Sandalwood 500 tons;—and will include the opening out of fresh teak, fuel, and sandal plantations and reserves, and the completion of those already existing; also the demarcation and blocking off of any new tracts taken up as State-forests.

28. Now that a large quantity of suitable land has been made over to the Forest Department for Railway fuel-plantations and sandal-reserves, it is hoped that more energetic measures will be taken for its utilization for these purposes. The progress hitherto made in this respect has not been satisfactory; and the subject requires the utmost attention possible on the part of the Conservator and his Assistants.

The work to be done under this head is very heavy and extended; and as the demarcation of reserves for fuel-plantations along the course of the projected railway from Bangalore to Mysore has also to be carried out, its due performance will tax the utmost energies of the Department.

It is, however, impossible to overstate the importance of this class of plantations, and the imperative necessity for pressing them on with all possible despatch.

29. In addition to the operations already referred to, arrangements will be required for the provision by the Department, of sleepers for the Mysore Railway, if the project be ultimately sanctioned; and for the transfer of the District forests to the Forest Department, should the scheme with that object meet with the approval of the Government of India.

30. The Department labored under much disadvantage, during the year under report, from the ill health of one of its Range Officers, Mr. Ludlow, and the inexperience of two others who were appointed during the year, Messrs. Ring and King, the former of whom was necessarily put in charge of the Nandidroog Range soon after joining. Since the close of the year, it has had the misfortune to lose, by death, its best Executive Officer, Mr. C. Dobbs, Deputy Conservator.

Captain Jarrett, v. c.
Mr. Macpherson.
Mr. Hicks.

The recent appointment of three experienced Officers to fill the existing vacancies, will, it is hoped, be followed by a material improvement on the various points on which the present report shews such is needed.

31. The Conservator notices favorably the services of Messrs. Ring and King, and submits their names for promotion to the grade of Assistant Conservator. Both are hard working and zealous; and with some further experience, will doubtless become valuable Forest Officers.

32. The Conservator himself, Lieutenant van Someren, has worked with zeal and energy, and is entitled to the acknowledgments of Government.

BANGALORE,
5th August 1871.

R. J. MEADE,
Chief Commissioner.

CONSERVATOR'S REPORT.

Annual Report, No. 721, *dated* 21*st July* 1871, *on the management and conservancy of the Mysore Forests for the Financial year* 1870—71, *by* LIEUT. G. J. VAN SOMEREN, *Conservator.*

I have the honor to submit for the information of the Chief Commissioner of Mysore, the Progress Report of Forest Administration in Mysore for the year 1870—71.

INTRODUCTORY.

2. The introductory section of my report for 1869—70, contained a full account of the statistical data of the Province; gave a brief account of the several divisions and districts, sources of supply of timber and fuel; and of what had been done for forest legislation in the Province. It now only remains to notice the new measures and changes introduced during the year 1870—71.

3. *Forest Legislation.*—In para 62 of my report for 1869—70, I alluded to the inconvenience caused to Deputy Superintendents by their being compelled to try in their own courts, the most trivial forest offences. This has now been removed, the Government of India having sanctioned amendments, in section 36, 37, and 38 of the Forest Rules, which extend to Amildars of Talooks the power of trying such cases.

SPECIAL.

HEAD I.—STATE FORESTS AND FORESTS LEASED BY THE STATE.

FIRST SECTION.

4. During the year some additions were made to the list of State forests given in the report for 1869—70. None of them have yet been surveyed and measured, the area assigned to each is therefore only approximate. The additions are exhibited in detail in the following tabular statement:—

Range.	District.	No.	Talook.	No.	Name of Forest	Estimated area in square miles.	Remarks.
Nagar.	Kadoor	1	Lakkuvalli ...	1	Thegúrugudda in Jágar valley	20	Selected, and preliminary lines blazed by Mr. Dobbs.
	Shimoga	1	Shimoga	1	Sakrébailu	10	Demarcated and completed.
	Do	2	Do	2	Buthinabailu... ...	3	Do do
Nandidroog.	Toomkoor	1	Maddagiri ...	1	Maddagiri	5	Demarcated; posts not put up.
	Do	2	Do	2	Kandal	5	Adjoins Maddagiri.
	Kolár	1	Chikka Ballápura ...	1	Nandidroog	7	Nearly finished.

5. The Thegúrugudda forest is in the Jágar valley, and was selected by Mr. Dobbs, after a careful inspection. It is the land referred to in paras 27 and 83 of my last report, and is a valuable addition to the State forest's list.

The Sakrébailu forest abuts on the Shimoga-Agumbi road, near Sakrébailu, and contains much good wood. Between this jungle and Shankaragudda, (already on the lists) lies the Puradahál forest, which, it is hoped, will shortly be made over to this Department. If so, Shankaragudda, Puradahál and Sakrébailu will form one forest about 30 or 35 square miles in extent.

The Buthinabailu is a small slip of forest land which was added to the Shankaragudda forest.

6. In the Nandidroog Range portions of forest measuring in all about 5 square miles were selected and demarcated in the Maddagiri hills.

The adjoining jungles of Kándal which contain small teak and other good woods were blazed, but owing to the villagers not having yet been satisfactorily settled with, the forest has not been demarcated.

The jungle round the Nandidroog hill and at the foot of Brammagiri has been demarcated, but the work is not yet quite completed.

7. In the Ashtagram Range, no additions were made to the State forests. The work done in demarcating, cutting compartment lines, &c., will appear in the 4th section of this head.

8. The total area in square miles of State forests in the Province, as compared with last year, is given below :—

Year.	Deciduous.		Evergreen.	Remarks.
	Demarcated.	Blazed		
1869—70.	222	41	45 square miles indicated by natural boundaries.	* Includes 10 square miles of the old Killékával forest.
1870—71	247	106*		

9. The evergreen forests in the Ashtagram Range were specially inspected by Mr. W. King, Sub-Assistant Conservator, with the view of marking them off for cardamom cultivation. The work done by him will be reported on under "district forests."

SECOND SECTION.

Requirements of the Population in the vicinity of State Forests in the matter of wood, &c., how provided for.

10. This was sufficiently discussed in my report for last year.

THIRD SECTION.

Protection of the Forests.

11. The cutting of compartment lines was carried on during the year. I am glad to report that fires were again kept out of the Shankaragudda forest in Nagar, and the reserved plot in Ashtagram.

12. No changes were made in the posting of watchers.

13. *Breaches of Forest Rules.*—In the Nagar Range, twenty cases of breaches of the Forest Rules were reported. In sixteen, the offenders were convicted and punished; in one the accused was acquitted; and three are still under enquiry.

In Ashtagram thirty cases were reported. In eight the accused were acquitted, in three found guilty, and nineteen at close of the year were still under enquiry.

In Nandidroog thirty two cases were reported. In twenty six, the accused were convicted and punished; in six, they were acquitted. No cases were standing over at the close of the year.

FOURTH SECTION.

IMPROVEMENT AND EXTENSION OF THE FORESTS.

14. In the Nagar Range the following work was done :—

Name of Forest.	New Demarcations.	Compartment Lines.	Clearing old Lines.	Remarks
Buthinabailu	5 miles.	...	...	
Sakrébailu	6 miles.	...	...	
Lakkuvalli	...	12½ miles.	22½ miles	
Shankaragudda	...	3 miles.	6 miles.	

The cost per mile for new lines averaged Rs. 37, and for old clearings Rs. 10. Posts were put up all round the Lakkuvalli and Shankaragudda forests.

15. Three forest huts were built, one at Srigiri near Shankaragudda, one at Hannigiri between Srigiri and Sakrébailu, and one at Sukalarahatti in the Lakkuvalli forests. The total sum expended on these huts was Rs. 663—10—0.

16. In the Ashtagram Range, 18¼ miles of new lines cost Rs. 44—0—5 per mile, and 26½ miles old clearings cost very nearly 15 rupees per mile.

17. In the Nandidroog Range, parts of the Dévaráyadroog forests were revised. During the year, the whole demarcation of this forest was completed, old lines cleared, and 256 posts set up, at a total cost of Rs. 250—6—0. The work was done departmentally, and the exact number of miles has not yet been measured up. Within the boundaries of this forest is the Rangaswámi temple. As it was impracticable to prevent worshippers going to it, a sum of Rs. 40—12—0 was expended in fencing a roadway from Mutharáyanagudda to the temple, and in surrounding the temple itself with bounds, beyond which no one is allowed to pass.

18. In the Maddagiri forests, nearly nine miles were demarcated at a total cost of Rs. 89—9—0, but posts have yet to be erected.

At Nandidroog, about seven miles of lines were cut round the forest, but not cleared to full width.

The Killékávalu forest lines were blazed by forest watchers, at no additional cost to the Department. The settlement of this forest has yet to be completed.

PLANTATIONS.

19. Nagar Range, *Lakkuvalli Plantation.*—This teak plantation remains unchanged. It cannot be extended for reasons given last year—the probability of its being swamped by the Madras Irrigation Company. It contains 16,748 trees, none having died during the year.

Vittalamallappana Kanavé Teak Plantation.—At the close of the year there were in this plantation 25,698 seedlings and young trees, the whole extent of cleared ground having been planted up. A total sum of Rs. 449—1—7 was spent in planting and weeding these two teak plantations which together measure 35 acres.

20. When I last inspected the Kanavé plantation, I determined upon not extending it. The young trees were not looking well, and I desired the Deputy Conservator to open an experimental plantation, 3 acres in extent, at the newly selected Thégúrgudda forests in the Jágar valley. In doing so, and in determining upon not extending the plantation already commenced, I have been guided by the instructions contained in para 5 of Government of India orders on my report for 1869—70: (see letter No. 699 F of 15th November 1870, from Secretary to Government of India, Public Works Department, to Chief Commissioner of Mysore):

21. *Sandalwood Reserves.*—The old reserve at Shimoga was again sown over and is doing well, a new reserve at Anapanakatté, 4½ miles from Shimoga, was ditched and enclosed. It measures 250 acres; another plot measuring 250 acres was selected in the Anantapura Talook, and was made over at the close of the year to the Department. Both of these new places will be sown up this year.

22. *Ashtagram Range.*—In my report for 1869—70 (para 80), I mentioned that about 100 acres of forest land had been partially cleared and sown with teak, but that none had germinated. Shortly after writing that report, information was received, (see para 13 of Chief Commissioner's review of report), that the seeds at length had appeared above ground. During 1870—71, another plot of 100 acres was cleared and planted in the same way, and the seeds germinated well.

23. *Sandalwood Reserves.*—A fresh piece of land measuring about 250 acres, was taken up in the Periyápatna Talook and fenced. It was sown up and the seeds germinated freely, but suffered greatly from a fire which went through the plantation late in March. Regarding this unfortunate occurrence, the officiating Assistant Conservator reports, that Captain Ludlow, (then in temporary charge), carefully investigated the case, and exonerated the subordinates from all blame, as the fire entered the plantation across a high road.

24. A fuel plantation was opened at Hassan, under the supervision of the Deputy Superintendent, as the duties of the Assistant Conservator keep him almost entirely at Mysore. This plantation was ditched in on three sides, at an expenditure of Rs. 300, and a large portion of it planted up. It is intended to extend its boundaries, and it will eventually measure about 250 acres.

25. In September and October 1870, I made a tour through the Hassan District, and selected various sites for sandalwood reserves: but the Assistant Conservator had not the time to take up and fence the land selected.

26. *Nandidroog Range.*—Kumbárahalli plantation. This is a new plantation formed during 1870—71, in a portion of the State forest of Dévaráyadroog. It is intended for timber, and the trees to be grown are those indigenous to the locality, and the eastern talooks of Mysore, with one exception—the *eucalyptus globulus* (blue gum). The land selected lies in a sheltered valley among the Dévaráyadroog hills, and is easy of access from all sides. Ten thousand pits were dug ready for the plantings of 1871—72, and large nurseries were formed: about 1,800 young trees put down, are thriving. The trees selected as best adapted to, and most likely to succeed in, this locality, are:—bági and bilvára (*Acacia speciosa and acc: odoratissima*): hippé (*Bassia longifolia*): néralé (*Eugenia jambolana*): huluvé (*Terminalia. sp*). Teak is also being put down. The tree grows in the adjoining hills to a height of about 20 feet, and attains a maximum girth, at 3 feet from the ground, of 3 feet. Small as it is, it is much prized. In some low ground, near a tank, babúl is being reared for both timber and fuel.

Bamboos have also been sown in this plantation, and are doing well. Square plots of ground measuring ten feet by ten, were dug to a depth of eighteen inches, the soil well cleared and triturated, and the seed sown broadcast, and covered lightly with earth. This plan has proved very successful. Seed sown in trenches was washed out during the rains.

27. *Sandalwood Reserves.*—A plot of land measuring 610 acres in extent was selected for a sandal reserve near Bangalore. Since the close of the year the Deputy Superintendent has intimated that 450 acres are available.

A portion of the land selected at Hosaharidi (a fuel plantation) is intended as a sandal reserve. Large quantities of sandal seeds were collected by Mr. Ring, during the year, to be sown in favorable localities within the bounds of the State forests of Dévaráyadroog and in the new reserves.

28. During the year, several plots of land were selected by me for railway fuel reserves. An Assistant Superintendent having been directed to accompany me and settle all claims and disputes with all practicable dispatch, much land was gone over in July and August last. The following plots were made over to the Department, being about one half of the total requisitions.

Mársandra	...	...	...	...	Square acres.	524 (Surveyed).
Kurandhalli	...	...	...	...	Do.	324 do.
Appasandra	...	...	...	...	Do.	672 do.
Bowringpété	...	...	...	...	Do.	300 (Approximate).
Kengéri	...	...	...	...	Do.	450 do.

In June 1870, the Deputy Superintendent, Bangalore District, accompanied me to Jangamakóté, and some time afterwards, handed over to the Department a piece of land at Hosaharidi, measuring rather more than 2,000 acres in extent. This brings the total quantity of land taken up for fuel plantations in connection with railways, to 4,270 acres, in addition to the old plantation at Jadigénahalli, measuring 395 acres.

29. After obtaining the land, arrangements were made as speedily as possible for the enclosing of the tracts granted. Before the close of the year, the plantations at Mársandra, Kurandhalli and Appasandra, (1,520) acres in all, were enclosed by ditches 4 feet deep, 4 feet wide at top, and 2 feet wide at bottom. The excavated earth was thrown up on the inside, and an aloe hedge put down on the top of the bank thus formed. The Mársandra and Appasandra plantations were pitted throughout, and Kurandahalli nearly so.

30. The ditching of the Hosaharidi and Bowringpété plantations was not finished before the close of the year, but much work was done. At Kengéri, the contractor failed, and another man was appointed, this led to some delay.

31. *Jadigénahalli Plantation.*—A large proportion of this land was sown up in 1870—71, in the early rains. It is now upwards of seven months since I have had an opportunity of inspecting this plantation; but Mr. Ring reports that, though many seedlings died, the progress of the plantation is satisfactory.

32. *Eucalyptus Plantations in Nagar and Nandidroog.*—Attempts were made in both the Nagar and Nandidroog Ranges to grow eucalyptus globulus from seed. The results have not been good, but I am strongly of opinion that these trees will eventually succeed in parts of Mysore, and in the hill ranges of Bábá Budan and Gardangiri. To introduce several varieties of good timber trees into these localities is most important. Indigenous timber of any useful size is now very scarce, and in many parts not to be obtained. The fast growing eucalypti and Australian acacias will therefore be most valuable, and attempts should be made again and again to introduce them.

33. A small piece of land was enclosed and pitted at Santawéri near the Bábá Budan hills, and 1,000 eucalyptus seedlings were planted out in November 1870. I saw the plantation in April 1871, when almost every tree had died off. I attribute this partly to the late planting out of the trees, (which owing to the late arrival of the seeds could not well be avoided): but partly also to want of sufficient care in weeding and watering the young trees. I found them choked with weeds. It is matter of great regret that a year has been lost in this plantation, but I intend to try again this year. The range is now in temporary charge of an Officer of the Public Works Department, (owing to the death of the late Deputy Conservator), and will therefore not have full justice done to it, but I am unwilling to lose another year. A few trees of eucalyptus glob: growing in Mr. Porter's garden at Santawéri, and which were transplanted as seedlings in June 1870, are now upwards of 8 feet in height. The tree will therefore grow there.

34. Small plantations were tried at Lakkuvalli, at Sakrébailu and at Shimoga. A few seeds germinated at Lakkuvalli, and out of 20 seedlings 11 survived. Four of these have made fair growth, the highest being now nearly 8 feet. The nurseries at Sakré-

bailu and Shimoga were not successful. There are now ready for transplanting this year 1,000 seedlings. They will be put down in the kán portions of Shankaragudda and Sakrébailu forests.

35. I may here mention that a large proportion of the seed first received, did not germinate. Much of it was black in color, whereas the second supply is of a reddish brown. This leads me to think that much of the first supply had lost its vitality. A portion of the seeds received was given to the Revenue authorities to experiment with in different localities. Major Hay, the Superintendent of Nagar, has kindly promised to let me have some information as to the result, but I have not yet received it.

36. In Nandidroog, a large nursery was formed at the Dévaráyadroog hills in May 1870, but when the seedlings were about 1½ inches high, they were almost all destroyed by an insect, which cut the roots through just beneath the surface. A few survived, and have been transplanted at Kumbárahalli. The highest surviving plant is now 8 feet 4 inches high. A new nursery was made, and it is hoped that several hundreds of trees will be planted out this season.

37. *Collection of fuel seeds.*—Large quantities of seeds, 331 maunds in all, (about 4 tons weight) were collected in the Nandidroog Range for fuel plantations, and about one third of a ton weight of sandal seed.

During May 1871, I went to the Nílgiri hills on casual leave for a week, and there obtained at a cost of Rs. 5 about 20 lbs. weight of acacia melanoxylon seeds, which I brought back with me and intend trying at the Kumbárahalli plantations.

38. *Roads.*—In the Ashtagram Range Rs. 200 were spent in improving the forest roads, along which timber is conveyed.

FIFTH SECTION.

Actual yield of Forests, disposal of Timber, &c.

39. *Nagar Range.*—The fellings in the Nagar Range are shown below:—

Teak logs	Teak poles	Jungle woods	Remarks.
1,204	362	1,037	The wood was not measured till stored, payment for felling in this range being per log. 804 teak logs were felled, 400 being windfalls

40. Collections at depôts and sales.

Woodyard.	Collection of timber in cubic feet	Collection of poles and branch pieces.	Total cost per cubic foot	Cubic feet sold.	Rate	Amount.	Remarks.
Lakkuvalli	Teak 18,817. Jungle 18,907.	Branch pieces 960	0 3 3	Teak 43,820 Jungle 17,677.	1 1 2	46,091	
Shimoga ...	Teak 3,336. Jungle 60.	Teak poles 1,037	0 3 7	Planks 34	0 15 1 2 5 2	16,691 96	
Sakrebailu	Teak 3,321. Jungle 7,791	Teak branch pieces 102.		Teak poles 422.	1 0 9	442	
Chóranayaduballi ...	Jungle 2,947.	..		Jungle branch pieces 960.	0 5 0	302	
				Teak branch pieces 102.	2 7 2	250	
Aiyanúru ...	Jungle 704.	...	...	.	...	...	Trees felled in opening a road and stacked at Aiyanúru

41. Sandalwood.

Collection in tons at stores.	Total cost per ton.	Tons sold.	Rate.	Amount in Rupees.	Remarks.
297	44 4 8	232¼	306 11 0	70,609	Mostly good wood, but 60 tons being old wood & chips the average is low.
87¼		87¼	8 15 4		Useless wood, sold as firewood chiefly at taluk head quarters.

In accordance with general instructions (see *Mysore Gazette*), the collections are shewn in English weights, and not as hitherto in kandís. One kandi = 560 lbs, or ¼ of a ton.

Ashtagram Range.

42. Fellings.

Teak, cubic feet.	Jungle, cubic feet.	Branch pieces and poles.		Remarks.
		Teak	Jungle.	
7,593	20,162	4,609, including 400 poles, each measuring one cubic foot.	2,332	Wood is measured in the forests payment being at the rate of one anna per cubic foot for felling.

43. Collections at depôts, sales, &c.

Woodyard	Collection.	Total cost per cubic foot.	Cubic feet sold.	Rate.	Amount.	Remarks.
Mysore	40,657 Cartloads	0 6 11½ Cartloads	19,956 Cartloads	0 14 0 Cartloads	17,415	
Antharsanthé	78¾	2 4 3	5	4 3 2	20	Small depôts of jungle wood for sale.
Gundlupété	9¾	4 0 0	10	9 3 2	92	
Hunasúru	11	4 0 0	5	5 3 2	26	

Of náyibyála (*Acacia leucophlœa*) bark, 32 cartloads were collected at Hunasúru, costing the Department Rs. 160 in all: 20 cart-loads were sold and realized Rs. 240.

44. Sandalwood.

Collection in tons.	Cost per ton.	Tons sold.	Rate.	Amount.	Remarks.
378¾	43 8 0	332¾	342 6 4	1,33,935	Good wood.
		31	94 12 8	2,939	Old wood and chips.

Nandidroog Range.

45. No timber is felled in this range. The Anché Department was supplied with 3,250 gorivi sticks, realizing Rs. 152—4—0, and costing the Department Rs. 50—12—6.

46. Sandalwood.

Collection in tons.	Cost per ton.	Tons sold.	Rate.	Amount.	Remarks.
117¾	38 15 0	85½	378 14 4	32,396	Good wood.
		23¾	59 2 8	1,376	Old wood & outside chips.

47. Comparing the rates obtained per ton for sandalwood, range by range, for the past six years, 1865—66 to 1870—71, the following is arrived at.—

Year.	Nagar.	Ashtagram.	Nandidroog.
1865—66	204 8 0	270 0 0	250 0 0
1866—67	...	336 8 0	254 12 0
1867—68	268 4 0	323 8 0	297 8 0
1868—69	264 0 0	345 8 0	342 0 0
1869—70	343 4 0	359 12 0	368 4 0
1870—71	306 11 0	342 6 0	383 4 0

For the comparatively low rates in 1865—66. I can find no reason in the records of the Conservator's office. In 1866—67, none but white chips were sold in Nagar, the collection being very short. High rates were obtained in 1869—70, owing chiefly to a large attendance of buyers. In the year now under report the rates were lower in Nagar, owing partly to a quantity of old wood having been carefully collected in the jungles and brought in, partly to fewer purchasers being present. Still the rates are higher by Rs. 38 per ton, than any obtained in former years, with the exception of 1869—70.

48. In Ashtagram rates have been on the whole steady, averaging in the last five years Rs. 340 per ton.

49. In Nandidroog rates have risen steadily year by year from Rs. 250 to Rs. 383—4—0 per ton. This I attribute chiefly to the fact of Bangalore being the capital: to the yearly increasing number of purchasers, and to the proximity of a railway. Nagar on the other hand is remote from railways and telegraphs, and until that part of the country is rendered more accessible, rates will be lower than those in the two other ranges.

DISTRICT FORESTS.

50. In para 101 of my report for 1869—70, I mentioned the necessity that existed for the careful supervision of the district forests, which are under the Revenue authorities. I then stated that a plan for establishing a number of small depôts would shortly be submitted for orders. This was done, but owing to the very different opinions held by various officers as to the Department which should control such depôts if established, and to the fact that neither in the Revenue nor Forest Departments was there any establishment which could be utilized for the work, much delay was caused. This was complicated by the many transfers which occurred last year among the Superintendents and Deputies.

51. The Chief Commissioner at length sanctioned the scheme being tried for one year in the Ashtagram Division, under the control of the Revenue authorities. Within a very short time of this order being issued, Major Elliot, re-joined from leave, and gave his opinion that the scheme should be carried out by the Forest Department. All this led to great delay, but a definite scheme has now been proposed by me to the Superintendents of Divisions. The Districts have been divided into circles of supply, the localities for depôts selected ; the necessary establishments to work the scheme, and to plant up annually about 15,000 acres throughout the Province have all been estimated for ; and immediately on the receipt of replies from the Superintendents, the whole matter can be laid before the Chief Commissioner for orders.

52. The Superintendents are all now, I believe, of opinion that the Forest Department should carry out the work, and that to do so an adequate establishment is needed. No one doubts the necessity of the district forests being more carefully worked, and the idea of establishing a number of small depôts for supplying the public generally with wood of all descriptions, is allowed by all to be good and feasible.

53. While however the scheme was being discussed, district forests were carefully inspected. In Nagar, the Superintendent of the Division accompanied by the late Deputy Conservator, traversed the district forests in Shikáripura, in Honnáli, round Ubrani and Adjampura in Taríkere, and those in Chennagiri. The Conservator and Deputy Conservator carefully inspected those in Soraba and portion of Shikáripura. The settlement of the Soraba Talook took place in April 1871, when 35,525 acres of district forest were handed over to the Forest, by the Revenue Settlement, Department.

54. The Conservator in company with the Deputy Superintendent of the District, made a tour through the greater portion of the Hassan District, and selected forests for reservation, and land for plantations and sandal reserves. A special report on the Hassan District was submitted by the Conservator in October 1870.

55. The Closepété and adjoining forests were visited and inspected by the Conservator and Sub-Assistant Conservator in charge of Nandidroog Range, and large

extents of forest land were provisionally selected. The Koratagere and Maddagiri forests were carefully inspected; portions of the latter were set off as State forests.

56. The tours I made, while selecting land for railway fuel reserves in Nandidroog; through Hassan District; through the talooks of Nagar and Ságara, with the special object in view of reporting on kumri cultivation; through the Honnáli, Soraba, Shikáripura, and Harihara Talooks in North Nagar; and through the Closepété jungles; all tended to confirm in my opinion the need of bringing the greater part of the district forests under the direct working of Government; and also enabled me to gather much useful information on the best method of doing so.

57. Mr. W. King was specially deputed to inspect the Western Gháts' forests in Manjarábád Talook in Hassan District, and to mark them off for cardamom cultivation. He visited all the State forests and most of the district forests which were suited for the cultivation of cardamoms, and sent in a report, which shews that in the State forests 741 acres, divided into 20 blocks, were suited to the purpose. The Chief Commissioner in orders passed in April 1871, has ruled that the district forests suited for cardamom cultivation should be taken over by the Forest Department, and that the maximum number of acres in each plot should not exceed 200. Rules laying down the conditions on which land should be granted were issued, and the forests will have to be demarcated and set off in plots in accordance with these rules during 1871—72.

GENERAL.

HEAD I.—FINANCIAL RESULTS.

58. These are now exhibited under the main heads of the Budget, range by range, and compared with the estimates set forth in parallel columns. The total results for the Province are exhibited in the Abstract summary of revenue and expenditure (form No. 21.)

59. The results for the *Nagar Range* were as follow:—

Receipts.		Budget Estimates	Actuals.	Expenditure.	Budget Estimates	Actuals.
I. Sale of timber brought to depôts by Government		1,45,000	1,44,427	*A. Conservancy & Working.*		
II. Sale of wood, &c., removed by purchasers ...		10,000	16,320	I. Timber expenses	22,650	23,063
III. Duty on foreign timber		...	...	II. Purchase of tools	800	884
IV. Permit fees		...	...	III. Feed and keep of cattle	...	...
V. Grazing dues, &c.		500	115	IV. Rent of leased forests	..	...
VI. Sale of minor forest produce		3,000	436	V. Charges for collecting revenue and grass, &c...	400	...
VII. Do. of confiscated drift and waif timber ...		1,000	5,467	VI. Plantations	5,000	1,930
VIII. Fines and forfeitures		500	...	VII. Forest works	400	117
IX. Miscellaneous		3,000	1,108	VIII. Forest survey	500	494
				IX. Experiments to test value of timber, &c. ...	...	...
Total		1,63,000	1,67,873	X. Communications, buildings, demarcations, &c	5,000	2,024
Deduct expenditure		54,872	53,733	Total.....	34,750	33,512
Balance		1,08,128	1,14,140	*B. Establishments.*		
Deduct—						
				I. Salaries	17,892	17,645
Value of stock at commencement of 1870—71	64,890			II. Travelling Allowances	1,600	1,799
Outstandings at 1870—71	10			III. Contingencies	630	777
	64,900	.	64,900			
Add—			49,240			
Value of stock at close of 1870—71 ...	81,558					
Outstandings at close of 1870—71 ...	2	...	81,560	Total.....	20,122	20,221
Net Revenue.....		...	1,30,800	Grand Total.....	54,872	53,733

60. *Receipts.*—Under various heads of receipts a total increase of Rs. 10,787 appears, and a total decrease of Rs. 5,914, showing a total increase of Rs. 4,873. The details are;—

Increases.—Under head II, "Wood sold on license," Rs. 6,320, owing to larger demands for such wood, cut chiefly in talooks bordering on Bombay. This would have been still larger, but that two months before the close of the year, the Deputy Conservator ceased issuing any more licenses in these talooks. Under head VII, "Confiscated wood," an increase of Rs. 4,467. This is an item which it is impossible to estimate correctly.

Decreases.—Under head I, " Sale of timber at depôts," a decrease of Rs. 583, which needs no particular explanation.

Under head V, a decrease of Rs. 385, owing to grazing being much restricted.

Under head VI, "Sale of minor forest products," a decrease of Rs. 2,564. Mr. Dobbs was not able to give this matter as much attention as he wished, owing to press of other work. The products were therefore sold on contract, and Rs. 436 only realized. On the other hand there was no expenditure. Head VIII, a decrease of the whole estimated amount; there being no fines credited to the Department. Under head IX, "Miscellaneous" a decrease of Rs. 1,882, a difficult item to estimate.

61. *Expenditure.*—Under various heads of expenditure, a total saving of Rs 1,139 was made :—

Decreases	6,982
Increases	5,843
Balance ..	1,139

Decreases A.—Under head V, "Charges for collection of revenue on forest products, &c.," the total estimate of Rs. 400. The minor forest products having been sold on contract, no expenditure was incurred. Under head VI, "Plantations", a decrease of Rs 3,070, owing to short work and the non-extension of plantations : see paras 20 and 33 of this report.

Under head VII, "Forest Works," a decrease of Rs. 283 unexpended.

Under head VIII, "Forest Survey," a decrease of Rs. 6 unexpended.

Under head X, "Communications and Demarcations," a decrease of Rs. 2,976, owing to less work being done than was expected.

B.—Under head I, "Salaries," a small decrease of Rs. 247.

Increases A.—The main increase was under head I, Rs. 5,413, owing chiefly to adjustments of sums due for work done late in 1869—70. Under head II, "Purchase of tools," Rs. 84 was expended over estimate. Under B. II, "Travelling Allowances", an excess of Rs. 199 was expended, and under III, "Contingencies," Rs. 147 was also spent.

62. The sanction for transfers from one head to the other was accorded at different times, and as reported above, the total saving was Rs. 1,139.

63. The results for the *Ashtagram Range* are now exhibited.

Receipts.	Budget Estimates	Actuals.
I. Sale of timber brought to depôts. ...	1,47,750	1,26,412
II. Do removed by purchasers	4,000	1,847
III. Duty on foreign timber	...	...
IV. Permit fees.	...	...
V. Grazing dues.	500	18
VI. Sale of minor forest products	3,500	1,205
VII. Sale of confiscated and drift timber. ...	300	104
VIII Fines and forfeitures	100	840
IX. Miscellaneous	5,000	909
Total.....	1,61,150	1,31,335
Deduct Expenditure	61,748	52,084
Balance	99,402	79,251
Add—		
Value of stock at close of 1870—71 ... 1,35,443		
Out tandings at do do ... 12,210		1,47,653
		2,26,904
Deduct—		
Value of stock at close of 1869—70 ... 1,01,842		
Outstandings at close of do do ... 8,341		1,05,183
Net Revenue.....		1,21,721

Expenditure.	Budget Estimates	Actuals.
A. *Conservancy and Working.*		
I. Timber expenses.	28,150	30,499
II. Purchase of tools, &c.	800	637
III. Feed of cattle	...	...
IV. Rent of forests	...	...
V. Charges connected with collection of revenue on minor forest products	500	252
VI. Plantations	8,000	2,027
VII. Forest works	500	390
VIII. Forest survey	500	...
IX. Experiments to test value of timber	...	...
X. Communications, demarcations, &c. ...	5,000	1,544
Total	43,450	35,349
B. *Establishments.*		
I. Salaries...	16,068	15,074
II. Travelling Allowances	1,600	1,122
III. Contingencies	630	539
Total.....	18,298	16,735
Grand Total.....	61,748	52,084

64. *Receipts.*—Under various heads a total decrease of Rs. 30,555, and an increase of Rs. 740, leaving a total decrease of Rs. 29,815.

Decreases.—Under head I, "Sale of timber at depôts," there is a decrease of Rs. 21,338. Of this sum, Rs. 8,983, are outstandings due for sandalwood, which did not fall due before the close of the year, and were not paid up. The balance of Rs. 12,355 is chiefly due to short sales of timber, which I held, partly as the Mysore market is full of foreign timber, and partly because I anticipated the reception of orders to supply sleepers for the contemplated Mysore railway. Mr. Ludlow also failed in getting in the stores of jungle woods at minor depôts, hence there were no sales.

Under head II, "Wood removed by purchasers," there is a decrease of Rs. 2,135. This is a difficult item to estimate in Ashtagram, as much wood sold by planters in the adjoining Province of Coorg is unexpectedly thrown into the market, and thus a quantity of jungle wood at very low rates is supplied to small traders. Under head V, "grazing dues," Rs. 500 were estimated, and Rs. 18 realized. It being deemed advisable not to admit of grazing in the State forests.

Under head VI, "Sale of minor forest products," the actuals are Rs. 2,295, under estimates. Rs. 1,205 were realized, but there is still an outstanding of Rs. 560, which will be included in next year's realizations. The short realizations are also partly due to a contractor who had agreed to buy the minor forest products which had been collected, failing in being able to do so.

Under head VIII, "Sale of confiscated wood," Rs. 104 were realized against an estimate of Rs. 300.

Under head X, only Rs. 909 were realized against an estimate of Rs. 5,000. The Assistant Conservator lately in charge of the range, was very sanguine, that by opening out several fresh pits in the forests for catching elephants, and by careful collection of fallen wood, that a sum of Rs. 5,000 could easily be realized. The result has proved otherwise. Several new pits were excavated and old ones repaired, two elephants only were caught and one of them died on the spot. In collecting fallen wood Mr. Ludlow was very lax; in fact during the last three months of his being in Ashtagram, he did almost nothing, and throughout the year neglected his out-door work.

Increases.—An increase of Rs. 740 occurred under head VIII, a head for which it is impossible to estimate very accurately.

65. *Expenditure.*—Under various heads a total saving of Rs. 9,664 was made.

Decreases	12,049
Increases	2,385
Balance	9,664

Decreases.—Under head II, a saving of Rs. 163 in purchase of tools.

Under head V, charges connected with collection of revenue on minor forest products, a saving of Rs. 248, owing to short-work.

Under head VI, plantations, Rs. 5,973, owing in great measure to Mr. Ludlow's failing to take up land for fuel plantations; and in enclosing sandal reserves. This remissness is partly due to bad health, which obliged him to leave his range in March 1871.

Under head VII, Forest Work, Rs. 110 were unexpended; and under head VIII, "Forest Survey," no work was done.

Under head X, "Communications, Demarcations, &c.," only Rs. 1,544 were expended out of a grant of Rs. 5,000. This is due chiefly to short work in demarcating forests.

Under B, "Establishments," a total saving of Rs. 1,563 was made.

66. *Increases.*—Under head I, "Timber Expenses," Rs. 2,349. The estimates for felling and storing of timber were placed at annas 5 per cubic foot. It was, however, found necessary during the year, owing to the large demand for carts, to raise the carting rates to annas six and pies six per cubic foot. Thus the expenditure under A, head I, was increased, and paid for from other savings. The difficulty in this range has always been to obtain sufficient means of transport for wood felled. A contract was taken up in July 1870, by European agency, and much work done.

67. *Nandidroog Range.*—The results for the Nandidroog Range were:—

Receipts.		Budget Estimates.	Actuals.
I. Sale of timber brought to depôts ..		45 500	35,916
II. Sale of timber on license		4,000	1,640
III. Duty on foreign timber		...	...
IV. Permit fees		...	...
V. Grazing dues		400	...
VI. Sale of minor forest products		1,000	27
VII. Sale of confiscated drift and waif timber ...		300	...
VIII. Fines and forfeitures...		400	59
IX. Miscellaneous		1,500	817
Total.....		53,100	38,459
Deduct Expenditure		30,334	23,829
Balance.....		22,766	14,630
Add—			
Value of stock at close of 1870—71 ...	11,370		
Outstandings at close of 1870—71 .	508	..	11,878
			26,508
Deduct—			
Value of stock at commencement of 1870—71...	8,530		
Outstandings at commencement of 1870—71		...	8,530
Net Revenue		...	17,978

Expenditure.	Budget Estimates.	Actuals.
A. *Conservancy & Working.*		
I. Timber expenses	4,564	4,904
II. Purchase of tools, &c.	500	195
III. Feed and keep of cattle	...	...
IV. Rent of forests and compensation for land included in State forests	...	219
V. Charges connected with collection of Revenue on grass, &c ...	100	...
VI. Plantations	11,000	6,140
VII. Forest work	300	...
VIII. Forest survey	350	127
IX. Communications and demarcations ..	600	615
	17,414	12,200
B. *Establishments.*		
I. Salaries.	10,320	8,533
II. Travelling allowances	2,200	2,754
III. Contingencies	400	342
Total.....	12,920	11,629
Grand Total	30,334	23,829

68. *Receipts.*—Under all heads there is a total decrease of Rs. 14,641.

Under head I, "Sale of timber at depôts," a decrease of Rs. 9,584. This is owing almost entirely to short collection of sandalwood. The supervision of the range in 1869—70 was so bad under the Executive Officer then in charge, that after the sales of

that year, there was but a small quantity of wood (25 tons) left in store. During 1870-71, the range was in charge of Mr. King for 3 months, and of Mr. Ring for 9 months. This change of officers, both new to their work, and the introduction during the same year of a new system of collecting the wood by new men, all told against the work for the year.

Under head II, "Sale of Timber on license," a decrease of Rs. 2,360, which is not to be regretted, when it is considered that the non-issue of licenses saved much valuable wood. The right of selling wood off their kandáyem lands, granted to ryo's during 1870—71, also aided in reducing the sales from Government forests.

Under head V, no grazing was permitted in State forests.

Under head VI, "Sale of minor forest products," an apparent decrease of Rs. 973. The minor forest products were sold for Rs. 1,003, but there is an outstanding of Rs. 501. An item of Rs. 475 for sale of lac in the Kolár District, which should have been credited to this Department, was realized by the Revenue authorities, and credited by a mistake to them. Their accounts being closed, I now merely note this—and in my accounts have shewn the sales at Rs. 528, outstandings Rs. 501.

69. *Expenditure.*—In the Budget estimates as exhibited in the return (para 67), I have included the amount, granted on a supplemental Budget, sanctioned during the course of the year, and which totalled to Rs. 6,700: *viz.* under head VI, "Plantations," Rs, 6,000: under head B II, "Travelling Allowances," Rs. 700.

Under expenditure there is a decrease under various heads of Rs. 7,633, and an increase of Rs. 1,128, leaving a total saving of Rs. 6,505.

	Decreases.	*Increases.*	*Balance.*
	A. 5,788	A. 574	Rs. 6,505
	B. 1,845	B. 554	
Total..	7,633	1,128	

Decreases.—Under head A II, Rs. 305 unexpended in purchase of tools. Under head V, no expenditure was incurred in collection of revenue on grass, &c.

Under head VI, the short expenditure was due partly to Mr. King, who had charge of the plantations, being ordered to Ashtagram on special duty; and while so much work was not done on plantations, the pay of his office establishment was debited to Ashtagram and not to Nandidroog. The failure of a contractor at Kengéri also reduced expenditure under this head.

Under head VIII, "Forest Survey," a decrease of Rs. 223 unexpended. Under head B I, a decrease of Rs. 1,787, and under head B III, "Contingencies," an unexpended sum of Rs. 58 out of a total of Rs. 400.

70. *Increases.*—Under head A I, an increase of Rs. 340 in working expenses, for small wood felled in Dévaráyadroog. Under head IV, a payment of Rs. 219 for land taken up to complete the Dévaráyadroog forest, and paid for out of savings.

Under head X, "Communications," an increase of Rs. 15.

Under B II, "Travelling allowances," an increase of Rs. 554, owing chiefly to the travelling expenses of Mr. H. R. Ring from Indore, met out of other savings.

71. The expenditure in the Conservator's office is shewn in form No. 21,—annual summary of revenue and expenditure. As will be seen by the various returns, and the foot notes appended to them, the total transactions in cash, value of stock, outstandings, expenditure, &c., resulted in a clear profit of Rs. 2,58,937, of which Rs. 1,92,226 were in cash, not including the value of wood given to H. H. the Mahárája.

GENERAL REMARKS.

Contemplated Operations.

72. These were detailed in the papers submitted with the Budget for 1871—72. They were considerably modified by the orders of the Government of India on the Budget for that year. The work to be done will be:—

(*a*) To collect and sell in *Nagar Range*; teak 10,000 cubic feet and 1,000 poles. Jungle wood 40,000 cubic feet: sandalwood 200 tons.

To open an experimental teak plantation in the Thégúrgudda forest in the Jágar valley; and again plant up the *eucalyptus* plantation at Santawéri.

To open fresh sandal reserves.

To block off and work the forest lands lately handed over to this Department in the Soraba Talook.

To open out roads through Lakkuvalli and other State forests.

(*b*) In *Ashtagram Range*.—To collect and sell; teak 10,000 cubic feet and 1,000 poles. Jungle woods 40,000 cubic feet—branch pieces 500 cartloads: sandalwood 200 tons.

To take up and plant land for Railway fuel-reserves along the line of the contemplated Railway from Bangalore to Mysore.

To open fresh sandal reserves.

To add to the list of State forests.

(*c*.) In *Nandidroog Range*, to collect 100 tons of sandalwood.

To carry on selection and planting of Railway fuel-reserves.

To press on plantation work already on hand.

To open out fresh sandal reserves.

73. Should the contemplated Railway to Mysore be begun, the greater portion of the sleepers will be felled in the Ashtagram Range. Should the scheme for working the district forests be sanctioned, it will be begun in the coming year.

74. It will be noticed that in the report for this year, I have given the rates separately for good and bad sandalwood. By the new method of collection, the whole work of preparing and cleaning the wood, is done in the stores, and not as formerly, in the jungles. Much white wood is thus collected, which is all sold. To include in one, the rates obtained for such inferior sandal, would neither give an average for fair comparison with the rates of former years, nor the true value of the wood. The method of collecting sandalwood in whole trees, by uprooting them, introduced in 1870—71, has proved very satisfactory. The Manégars have strict orders to search for, and send in all old wood left out from former years. This is being done, and though the wood is not as a rule as good as new wood, owing to long exposure, it is valuable and sells at remunerative prices.

75. I was out in the districts the greater portion of the year, having during April and May 1870, traversed portions of the Chituldroog and Shimoga Districts. From June to September I was chiefly employed in selecting land for Railway fuel-reserves, and in taking Mr. Ring and Mr. King, when newly appointed, over the range and introducing them to their work. During September and October, I spent 30 days in the Hassan District, inspecting its forests in conjunction with the Deputy Superintendent. From November, I was out till the close of the official year (with one short interval of casual leave), visiting the Toomkoor forests, the Ashtagram Range and Coorg; and inspecting the line of Western Gháts in Nagar and Ságar for a report on kumri cultivation. In March the late Deputy Conservator accompanied me over the district forests of Soraba, Shikáripura and Honnáli. I returned to head quarters on the 26th of April 1871.

76. Mr. C. A. Dobbs, the late Deputy Conservator, was in charge of the Nagar Range. He was granted one month's privilege leave during the year, an Assistant Superintendent carrying on his duties. Mr. Dobbs was a good officer who worked right well, and his death was a heavy loss to the Department. Pending the arrival of a newly appointed officer (Captain Jarrett, v. c.), the range was placed in temporary charge of Colonel Babington, Executive Engineer.

77. Mr. Ludlow was in charge of the Ashtagram Range. He was granted one month's privilege leave during the year, and in March 1871, left his range on preparatory leave. He left India on the 16th April 1871 on medical certificate for two years, and has since been transferred to British Burmah. In September 1870 he was restored to his former grade of 2nd Assistant Conservator. Captain Ludlow, Assistant Superintendent, assumed temporary charge of the range on the 6th March 1871, and held it till the 22nd April when Mr. W. King, Sub-Assistant Conservator, employed on special duty, was appointed to officiate pending arrival of Mr. Macpherson from Burmah.

78. Mr. W. King was appointed Sub-Assistant Conservator, and assumed charge from me of the Nandidroog Range, on the 1st April 1870. He held it three months. when the Government of India appointed Mr. H. R. Ring to the post On the 26th July 1870, Mr. W. King was appointed Sub-Assistant Conservator in charge of plantations, and in November 1870, was detatched on special duty to Manjarábád in Hassan District. He is a hard working and careful officer and is doing well in his officiating appointment in Ashtagram. I beg to lay his name before the Chief Commissioner for promotion to the grade of 3rd Assistant Conservator. If this is not practicable just now, I trust the full pay of a Sub-Assistant Conservator (Rs. 200), will be granted him. At present he draws only Rs. 150.

79. Mr. H. R. Ring assumed charge of the Nandidroog Range on the 1st July 1870. On the departure of Mr. W. King to Manjarábád, Mr. Ring was placed in charge of plantations in addition to his own range work. He has worked very well, and done much in bringing the range into better order by carefully supervising his subordinates. I have already had the pleasure of reporting most favorably on Mr. Ring, and of recommending him for promotion to 3rd Grade Assistant Conservator.

80. In para 115 of my report for 1869—70, I referred to the case of Mahomed Modín Sheríf, a Sandal kóti Daróga, prosecuted by the Department for criminal breach of trust by a public servant. The case was a long and weary one, but was successfully carried through the lower courts to that of the Sessions Court of Ashtagram, which sentenced him to two years' rigorous imprisonment and a fine of Rs. 500. His associates, two merchants, were each sentenced to one year's rigorous imprisonment and Rs. 1,000 fine. All three appealed to the Judicial Commissioner of the Province, who on the 13th April 1871, threw out the appeal, and confirmed the decision of the Sessions Court. The whole of the stolen sandalwood was recovered, and held in deposit, pending the settlement of the case. It will now be sold on behalf of Government.

81. The subordinates of the Department generally, have worked to the satisfaction of their immediate superiors.

82. The number of receipts and issues of letters, in the Conservator's office, totalled during the year to 5,835.

Receipts.			*Issues.*	
English	1,953	..	English	1,612
Kanarese	1,184	..	Kanarese	1,086
	3,137			2,698.

G. J. VAN SOMEREN, *Lieutenant.*
Conservator of Forests, Mysore & Coorg.

Stock Account of Quantities and Value of Timber and other Forest Produce on hand at the commencement and close of the year 1870—71.

Description.	In depôt in 1st April 1870.		Add received during 1870—71.		Deduct issued or sold during 1870—71.					Remaining in Stock on 31st March 1871.		Remarks.
								Difference.				
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Amount realized.	Profit.	Loss.	Quantity.	Value.	
						Timber.						
		Rs. A. P.		Rs. A. P.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.		Rs. A. P.	
Nagar Division.												
Teak	1,694	22,022 0 0	1.065	13,845 0 0	1,834	23,8 2 0 0	46,416 7 0	22,574 7 0	...	925	12,025 0 0	Better prices than expected, the stock being unsaleable in 1839—70.
Blackwood	1	10 0 0	..	...	1	10 0 0	12 10 7	2 10 7	...	...	...	
Junglewood	653	6,530 0 0	1,186	11 800 0 0	652	6 520 0 0	16,711 14 0	10,191 14 0	...	1.187	11,870 0 0	Very good stock.
Stunted Teak Poles .	...	...	1 037	1,037 0 0	422	422 0 0	4 42 4 0	20 4 0	...	615	615 0 0	
Teak Branches	...	...	102	102 0 0	102	102 0 0	250 6 11	148 6 11	...	...	...	Better prices than fixed.
Junglewood Branches ...	...	...	960	916 0 0	960	960 0 0	302 0 0	...	658 0 0	...	...	Prices not obtained.
Total	2,348	28,552 0 0	4,350	27 804 0 0	3,971	31.8 6 0 0	64,135 10 6	32,937 10 6	658 0 0	2 727	24,510 0 0	
Ashtagram Division.												
Teak	2,450	31,850 0 0	4,287	55 731 0 0	2 454	31,902 0 0	5,153 15 4	...	26,748 0 0	4,283	55,679 0 0	Inferior wood sold, good wood held.
Blackwood	92	920 0 0	6	60 0 0	41	410 0 0	920 13 5	510 13 5	...	57	570 0 0	Better prices than fixed.
Junglewood	2,904	29,040 0 0	1,182	11,820 0 0	651	6 510 0 0	11,358 14 4	6,510 0 0	...	3,435	34,350 0 0	Do
Bamboos	1,600	32 0 0	1,611	32 3 6	1 011	20 3 6	120 8 0	100 4 6	...	2,200	44 0 0	Do
Total	7 046	61 812 0 0	7 056	67,643 3 6	*4,157	38,842 3 6	17,554 3 1	7 121 1 11	26 748 0 0	9.975	90,643 0 0	
Nandidroog Division.												
Teak	...	...	...	...	...	...	...	...	...	...	...	
Blackwood	...	...	...	...	...	...	...	...	...	...	...	
Junglewood	45	450 0 0	...	...	...	...	...	...	...	45	450 0 0	
Bamboos	...	...	...	...	..	...	...	...	...	...	...	
Total	45	450 0 0	...	...	...	...	..	..	...	45	450 0 0	
Grand Total	9,439	90,854 0 0	11,436	95 447 3 6	8 128	70,6.8 3 6	81,689 13 7	40,058 12 5	27,406 0 0	12,747	1 15.603 0 0	
						Sandalwood						
	Tons.											
Nagar Division ... Good wood.	108¼	34.640 0 0	297	95,040 0 0	232¼	74.320 0 0	78 891 9 2	4.571 9 2	...	173	55.360 0 0	Higher prices being obtained than expected.
Nagar Division ... Inferior ...	52¾	1 688 0 0	87¼	2,792 0 0	87¼	2 792 0 0	717 15 8	...	2,074 0 4	52¾	1,688 0 0	
Ashtagram Division .. Good wood.	125	40,000 0 0	378¾	1,21,200 0 0	332¾	1,06.480 0 0	1,13,935 0 0	7.455 0 0	...	140	44,800 0 0	Do
Ashtagram Division .. Inferior ...	...	...	...	...	31	992 0 0	2 939 0 0	1,947 0 0	...			
Nandidroog Division. Good wood.	25¼	8,080 0 0	117¾	37,680 0 0	85¼	27 330 0 0	32 396 0 0	5,066 0 0	...	34⅛	10,920 0 0	Do
Nandidroog Division. Inferior ...	.	...	...	...	2⅛	748 0 0	1,376 0 0	628 0 0	...			
Total...	311¼	84 408 0 0	880¾	2,56,712 0 0	792⅛	2 12 692 0 0	2,30,255 8 10	19,637 9 2	2,074 0 4	399⅛	1,12,768 0 0	
Grand Total	9,750	1,75,262 0 0	12,316	3,52,159 3 6	8 920	2,83,390 3 6	3,11,945 6 5	59,696 5 7	29,480 0 4	13,146	2,28,371 0 0	

*includes wood given to His Highness the Mahárája.

CONSERVATOR OF FORESTS' OFFICE, MYSORE & COORG,
Bangalore, 21st *July* 1871.

G. J. VAN SOMEREN, *Lieut.*,
Conservator of Forests, Mysore and Coorg.

Government Series, No. 21.

FOREST DEPARTMENT, MYSORE.

Annual Summary of Revenue and Expenditure in the Different Divisions during 1870—71.

Classification.	Direction.			Nandidroog Division.			Nagar Division.			Ashtagram Division.			Total.		
Receipts.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
i. Sale of timber at Depôts	...	...	...	35,915	9	9	1,44,426	9	4	1,26,412	5	2	3,06,754	8	3
ii. Do removed by purchasers	...	...	...	1,640	6	6	16,320	7	0	1,847	5	3	19,808	2	9
iii. Duty on foreign timber	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
iv. Permit fees	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
v. Grazing dues	...	...	...	...	...	...	115	5	10	18	0	0	133	5	10
vi. Sale of fruits, &c.	...	...	...	27	7	10	436	5	0	1,205	4	7	1,669	1	5
vii. Sale of confiscated, &c., timber	...	...	...	...	...	...	5,466	9	9	103	12	0	5,570	5	9
viii. Fines and forfeitures	...	...	...	59	0	0	} 1,108	2	3	839	13	0	} 3,733	7	9
ix. Miscellaneous	...	...	...	817	2	11				909	5	7			
Total Receipts.....	...	...	...	38,459	11	0	1,67,873	7	2	1,31,335	13	[illegible]	3,37,668	15	9
Expenditure.															
A. Conservancy and Working.															
i. Timber Expenses	...	...	...	4,904	8	7	28,063	4	2	30,499	8	1	63,467	4	10
ii. Purchase of stock and cattle	...	...	...	195	3	0	884	0	0	637	2	0	1,716	5	0
iii. Feed and keep of cattle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
iv. Rent of leased forests	...	...	...	218	15	6	...	...	...	...	...	...	218	15	6
v. Charges in collecting revenue on grass, &c... ..	...	...	...	...	...	...	...	...	...	251	15	5	251	15	5
vi. Plantations	...	...	...	6,140	13	5	1,930	4	3	2,026	9	0	10,097	10	8
vii. Forest work	...	...	...	...	...	...	117	6	11	390	2	7	507	9	6
iii. Forest survey, &c	...	...	...	126	12	0	493	9	5	...	...	...	620	5	5
ix. Experiments on timber	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
x. Communications and Buildings	...	...	...	614	4	5	2,023	9	2	1,543	9	6	4,181	7	1
Total Conservancy and Working	...	...	..	12,200	8	11	33,512	1	11	35,348	14	7	81,061	9	5
B. Establishment.															
i. Salaries...	10,699	4	1	8,533	3	8	17,645	3	3	15,073	14	0	51,951	9	0
ii. Travelling Allowances	1,719	8	3	2,753	9	4	1,799	4	3	1,122	6	2	7,394	12	0
iii. Contingencies	3,375	9	0	341	15	5	777	8	9	539	12	11	5,034	9	1
Total Establishment.....	15,794	5	4	11,628	12	5	20,221	11	3	16,736	1	1	64,380	14	1
Grand Total Expenditure.....	15,794	5	4	23,829	5	4	53,733	13	2	52,084	15	8	1,45,442	7	6

FOREST DEPARTMENT, MYSORE.

Annual Abstract Account of Forest Department in Mysore for the year 1870—71.

Cr. Dr.

Year.	Heads of Account.	Rupees.			Year.	Heads of Account.	Rupees.		
1870—71.	To Balance outstanding on 1st April 1870 ...	8,987	14	10	1870—71.	By Expenditure of the Department ...	1,45,442	7	6
	„ Revenue received	3,37,668	15	9		„ Advances recovered in cash and remitted to Treasuries	290	9	0
	„ Remittances from State Treasuries ...	1,52,097	7	9		„ Remittances to State Treasuries ...	3,35,536	9	9
	„ Deposits	...	...	...		„ Repayments of Deposits	...	...	...
	„ Advances received	...	...	...		„ Refund of Revenue	2,132	6	0
						„ Balance outstanding...	15,352	6	1
	Total Rs...	4,98,754	6	4		Total Rs... ...	4,98,754	6	4

Conservator of Forests' Office,
Mysore and Coorg,
Bangalore, 21st July 1871.

G. J. van SOMEREN, *Lieut.*
Conservator of Forests,
Mysore and Coorg

Government Series, No. 23.

FOREST DEPARTMENT, MYSORE.

Annual Statement of Outstandings and Liabilities of the Department on account of Contractors and Disbursers for the year 1870—71.

Divisions.	Department Debtor.			Department Creditor.			Balance due.		Remarks.
	At the commencement of the year.	Recoveries in cash & in work done during the year.	At close of the year.	At the commencement of the year.	Payments made during the year.	At close of the year.	To Department Outstandings.	By Department Liabilities.	
Nandidroog ...	...	12,357 7 2	12,357 7 2	430 15 10	15,456 3 9	15,887 7	3,529 12 5	...	
Nagar	...	33,555 9 9	33,555 9 9	3,174 7 9	34,419 1 8	37,593 9 5	4,037 15 8	...	
Ashtagram ...	...	35,439 1 6	35,439 1 6	5,382 7 3	*37,841 4 3	43,223 11 6	7,784 10 0	...	
Total...	...	81,352 2 5	81,352 2 5	8,987 1 10	87,716 9 8	96,704 8 6	15,352 6 1	...	

*Rupees 54—1—5 overcharged in the working charges Bill for October 1869 is recredited this year.

Government Series, No. 28.

FOREST DEPARTMENT, MYSORE.

Annual Account of Forest Revenue for 1870—71.

Receipts	3,37,668	15	9
Expenditure	1,45,442	7	6
Surplus...	1,92,226	8	3
Add (or Deduct) difference between Assets and Liabilities at the commencement and close of the year	66,711	0	0
Net Revenue.....	2,58,937	8	3

N. B.—Besides the above, wood to the value of Rs. 12,978—6—11 was given to His Highness the Mahárája.

Detail of Difference between Assets & Liabilities at the commencement and close of the year 1870—71.

	At commencement of the year.	At close of the year.	Difference. In favor of the year.	Difference. Against the year.
Value of timber and other stock	1,75,262	2,28,371	53,109	...
Outstandings on account of Contractors, &c.	8,988	15,352	6,364	...
Do on account of sales, &c.	3,350	12,720	9,370	...
Total Assets...	1,87,600	2,56,443	68,843	...
Deduct Liabilities, being amount refunded	...	...	2,132	...
Balance	...	..	66,711	...

Conservator of Forests' Office,
Mysore and Coorg,
Bangalore, 21st July 1871.

G. J. van SOMEREN, *Lieut.*
Conservator of Forests,
Mysore and Coorg.

Mysore Government Press, Bangalore—1871.

APPEDNIX T.

PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

PROVINCE OF COORG,

1870—71.

By LIEUT. G. J. VAN SOMEREN,
CONSERVATOR OF FORESTS

REVIEW BY THE CHIEF COMMISSIONER.

The Progress Report has been drawn up by Lieutenant Van Someren, Conservator of Forests in Mysore and Coorg.

2. The report, again this year, has not been prepared in accordance with the instructions contained in Circular No. 18 F, dated 4th November 1868, from the Secretary to the Government of India in the Public Works Department (Forests); the reasons for which are explained by the Conservator in his opening para. The explanation can hardly be regarded as satisfactory; and if the preparation of the report had been put in hand at the proper time, it ought to have been submitted without difficulty by this date, complete, and in the prescribed form. It is hoped that the next Progress Report will call for no comment on this head.

3. In reviewing the report, it will be necessary to follow the headings adopted therein, instead of those laid down in the Circular already referred to.

Yield of the Forests.

4. The felling operations of the year were still more limited than in 1869—70. The number of teak logs cut, aggregated only 551;—of sandalwood 50 tons were collected, all from North Coorg.

5. The sales of timber were small; the causes of which are explained in paras 5 and 6 of the report. The principal appear to be the want of demand from the market, and depôts being overstocked.

6. The sale of sandalwood realized but half of what was obtained under this head in the previous year; only 64 tons, (256 kandís) having been sold, against 133 tons (534 kandís) in 1869—70. The rate realized was higher than in the latter year; but the increased cost of collection, the cause for which requires to be closely enquired into, was almost equal to the rise in the sale rates. In a subsequent para (18) of the report, the Conservator explains, that it was believed that the sandalwood offered for sale amounted to 90 tons (360 kandís); but it was discovered after the sale, that it was only equal to 64 tons, as above.

7. The stock of timber and sandalwood in store at the close of the year, aggregated in value Rs. 25,301 and Rs. 400 respectively. The sales of wood on license,

realized Rs. 6,423; and a quantity of bamboos, jungle posts, &c., valued at Rs. 3,479 was allowed to be cut, without charge, by the sepoys of the regiments of Native Infantry at Mercara, for use in rebuilding their lines at that place.

Plantations.

8. The work under this head, has been unavoidably limited during the year by the want of funds, and has been confined to the planting up and further clearing of the teak plantations at *Kármád* and *Kattampollé*, (which have now 253 acres planted, and 140 acres cleared and ready for planting,) and making preparations for sowing up a portion of a plot of 600 acres, selected for this purpose by the Conservator near Vittúr in the Kiggatnád Talook. The condition of the young teak trees in the Kármád and *Kattampollé* plantations is reported to be satisfactory; though both plantations were found by the Conservator, on his visiting them in January last, much overgrown with weeds, the removal of which had been prevented from want of funds. These have since been cleared away. The cost of labor in the neighbourhood of these plantations is stated to be likely to increase considerably, as it has all to be imported.

9. Nothing has yet been done towards the establishment of sandal-reserves, notwithstanding the urgent orders that have been issued on the subject; and the Conservator reports that the Assistant Conservator does not seem to understand the importance of this part of his duty. There is no doubt some difficulty in obtaining plots of suitable land for this purpose, in Coorg; but the causes of the failure of the Department to make any *progress whatever* in carrying out the measures enjoined by the Government of India on this head, must be fully reported on by the Conservator.

10. The expenditure on plantations was Rs. 5,956.

Demarcation of Forests.

11. A complete list of the forest tracts selected as State forests, with their respective boundaries duly defined, was drawn up by the Conservator during his visit to Coorg, in the early part of the present year, and has been submitted to the Government of India, in view to the issue of a Notification reserving them accordingly.

12. The Conservator again reports the remissness of the Assistant Conservator in not attending to the instructions given him regarding the demarcation of some of these forests; and it has been necessary to direct the submission of periodical reports of the progress he is making with this important work.

Financial Results.

13. The gross receipts amounted to Rs. 74,067, against an expenditure of Rs. 24,557, leaving a balance of Rs. 49,510, of which sum Rs. 33,207 was realized from stock in hand, and outstandings due at close of 1869—70; the net receipts of the past year being Rs. 16,303, and the value of stock in hand and outstandings due at the close of the year, Rs. 36,611.

14. The receipts fell short of the Budget estimate by Rs. 4,933, as shewn in the Conservator's statement; but really, by the large sum of Rs. 13,133, as Rs. 8,200 included in the year's receipts, from sale of sandalwood, will have to be refunded to the purchasers, in consequence of the short *weight in the quantity sold, discovered after the sale. The explanation given of the cause of this very serious error (para 22) is wholly unsatisfactory; and the Conservator will at once institute a full enquiry into the circumstances, and report the result. Apart from the shortcoming caused by this circumstance, the diminution of receipts was due, (1) to the failure of an auction sale of timber held at Hunasúru; (2) to the total amount of cardamom rents not having been realized by the Revenue authorities; and (3) to no items having been realized under the head of "Miscellaneous."

* 26 tons.

15. The expenditure was within the Budget estimate by Rs. 443; an excess outlay under—

	Rs.
Timber expenses, of..	2,259
Plantations, of	1,956

being covered by savings under other heads.

16. A supplemental Budget grant of Rs. 6,200 to meet the cost of bringing to the *depôts a large quantity of old felled timber lying in the forests, and of completing the † Sandal kóti, was sanctioned by the Government of India at the close of the year; but the intimation of the same did not reach the Conservator till after the 31st March, when the amount lapsed, and the charges remained unliquidated.

*Rs. 4,000.
†Rs. 2,190.

General Remarks.

17. The explanation of the extraordinary error in the quantity of sandalwood collected for sale under this heading, given in para 22 of the Progress Report, appears, as already remarked, to be quite insufficient, and the matter must be closely enquired into.

18. The report of the state of the Assistant Conservator's office (para 24) is not satisfactory; and as it seems to be clear that Mr. Hunter is not qualified for the duties of his present post, the Conservator will submit in a separate communication, a proposal for his transfer, on an opportunity offering, to a less difficult and responsible charge.

19. Any proposals he desires to make in connection with the Assistant Conservator's Office establishment, should be similarly submitted, separately, at an early date.

20. The operations of the year, under report, have been in some respects far from satisfactory. The receipts have fallen considerably short of the estimate, chiefly through an error, which at present appears to be inexplicable; and no progress has been made in two of the most important parts of the Assistant Conservator's duty; *viz.*, (1) the demarcation of the forests; and (2) the establishment of Sandal reserves. To both these subjects it will be the duty of the Conservator to give his special and most earnest attention, and to take such steps as will prevent similar barren results, in respect of them at least, appearing again in the Progress Report for the current year.

Contemplated Operations.

21. The contemplated operations for the present year, as set forth in the concluding para of the Progress Report, under sub-heads *a* and *b*, do not call for remark. The demarcation of the forests, the establishment of Sandal reserves, and the extension of the existing teak plantations, so far as the funds available for the purpose will admit, all demand vigorous effort and attention on the part of the Department.

Bangalore,
7th July 1871.

R. J. MEADE,
Chief Commissioner of Mysore & Coorg.

CONSERVATOR'S REPORT.

Annual Report, No. 593, *dated 4th July* 1871, *on the management and conservancy of the Coorg Forests for the Financial year* 1870—71, *by* LIEUT. G. J. VAN SOMEREN, *Conservator.*

I have the honor to forward for the information of the Chief Commissioner, the Coorg Forest Progress Report for the year 1870-71.

2. It is not drawn up in accordance with the suggestions in Circular No. 18F, of November 1868 from Government of India in P. W. D. This is not done ; partly because two out of three reports, for the year 1870-71, submitted by Range Officers in *Mysore*, were sent in by men who joined the ranges after the close of the year on which they reported, and required much careful scrutiny ; partly because this, the second of the two annual reports submitted by me, is already due, and I do not feel justified in submitting a hurriedly written account of the Coorg forests ; and lastly because the State forests in Coorg are not yet demarcated.

3. YIELD OF THE FORESTS.—

LOCALITIES.	Teak logs.	Jungle logs.	Branch pieces.	Cost.	Remarks.
Nalkerri Kanavé	541	...	...	Rs. 1-4-8 per log.	
Tittimatti	10	114	...		

Sandalwood.

4. Of sandalwood, 50 tons (200 kandís) were collected ; all from North Coorg.

5. Collections at depôts, sales, &c.

Timber.

DEPOT.	Collections.		Sold.			Amount in Rupees.	Remarks
	Teak.	Jungle.	Teak.	Jungle.	Branch pieces		
Hunasúru	795	172	223	19	42	4,924	
Tittimatti	117	79	6	...	...	150	
Fraserpété	28	243	22	211	...	891	
Chinvárkóté	9	14	9	5	...	85	

The sales at Fraserpété and at Chinvárkóté were by auction. At Hunasúru an auction was to have been held on the 3rd October 1870, and was duly advertised. It was however so badly attended that Mr. Hunter would not hold it. The sales effected were entirely retail. Selling prices of teak averaged Rs. 1 to Rs. 1—4—0 and of jungle wood Rs. 0—12—0 per cubic foot.

6. There is a large stock of timber now in the Mysore Country, and this accounts for the poor attendance at the auction. In January a tender for the purchase of 600 logs of teak at Rs. 0—13—0 per cubic foot was accepted ; but the would-be purchaser

failing to pay up his deposit, the contract was cancelled. Another man has since tendered for the purchase of 1,000 logs of teak at Rs. 0—13—0 per cubic foot ; but as there is good reason for doubting his ability to pay the amount, the matter is under consideration. If the wood be not sold, tenders will be called for by public advertisements, as it is useless to hold the stock any longer. The revenue realizations have, however, suffered meanwhile.

7. *Sandalwood.*

Collections in Tons.	Cost.	Tons sold.	Rate.	Amount.
50	40—12—0	64	349—2—6	22,351

The quantity is this year shewn in tons, not as hitherto in kandís : the selling price has risen by Rs. 3—0—7 per kandi, (or fourth of a ton) : the price for collection has increased from Rs. 7—7—6 to Rs. 10—3—0 per kandi. The Assistant Conservator has been called upon for an explanation of this difference. It is partly explained by the fact of all wood being carried to the stores at Fraserpété for preparation, which has not hitherto been done, but this alone is not sufficient to account for it.

8. Stock in hand at close of the year is returned as.—

				Rs.
Teak logs	1,659	valued at	..	21,567
Junglewood	448	"	..	3,584
Branch pieces	105	"	...	150
Sandalwood	1¼ tons	"	..	400
			Total..	25,701

9. The stock of sandalwood is very small, and the Assistant Conservator has been called upon to explain the reason for this, as he should by this time have had fifteen to twenty tons in store.

10. *Sale of wood on license.*—By wood sold on license a total sum of Rs. 6,423—3—5 was realized. In addition to the above, a quantity of wood valued at Rs. 3,478—14—4 was granted free to men of the 8th Regiment, Madras Native Infantry, in accordance with instructions from Secretary to Chief Commissioner of Coorg.

The quantity is detailed—

								Rs.		
Bamboos ..	47,400	at	Rs.	6	0	0	per 1000	284	6	4
Honné ..	63	cartloads	"	6	0	0	per cart	378	0	0
Arsentéga..	15	"	"	3	8	0	do.	52	8	0
Sampigé ..	1	"	"	4	0	0	do.	4	0	0
Jungle posts	460	"	"	6	0	0	do.	2,760	0	0
							Total	3,478	14	4

Teak Plantations and Nurseries.

11. *Kármád Plantation.*—Here, 100 acres of land cleared in 1869—70, were planted up. 50 acres were also cleared for the plantings of 1871—72. Including the work of 1869, there are now at Kármád—

			Acres.
Planted up	..	..	153
Ready for planting	..	..	50
		Total	203

The total expenditure on this plantation from its commencement has been Rs. 5,407.

	Rs.
1867-68	57
1868-69	411
1869-70	2,316
1870-71	2,623
Total	5,407

Weeding has been very expensive work of late, but is absolutely necessary. When I inspected the plantation in January 1871, I found it much overgrown with weeds, owing to want of funds for the work. It has since been cleared. The *misses* in plantings of 1870-71, amounted to 12 per cent, which will be replaced during the monsoon of 1871—72. Had sufficient funds been available, 100 acres would have been cleared here. The young trees in this plantation were, when I inspected it, looking strong and healthy.

12. *Kuttampollé Plantation.*—Here in 1868-69, an experimental plantation of one acre was opened. It promised well, and in 1869-70 land 100 acres in extent was cleared. This was in 1870-71 pitted and planted out, and 40 acres additional were cleared for the plantings of 1871-72. Want of funds prevented more being done. This plantation when last inspected by me was also very weedy. The growth of teak at this place is very great. In February 1871, I submitted a detailed report on these plantations for the information of the Chief Commissioner (this office No. 1389 of 15th February 1871). I reported that I anticipated a very great rise in the cost of felling, as labor has all to be imported; and a coffee planter close by was offering Rs. 16 per acre for felling only. The Chief Commissioner (Secretary's letter No. 123 F of 28th February 1871) referring to my report directed that "the suggested extension of the Kuttampollé plantation must be considered hereafter." The felling season will again come round in January; before that orders will be requested. The percentage of misses in this plantation was a little lower than that at Kármád (12 per cent).

The plantation now measures—	Acres.
Planted up	101
Pitted	40
Total	141

The expenditure has been—	Rs.
1868-69	100
1869-70	1,320
1870-71	1,293
Total	2,713

13. Nurseries have been formed at both plantations.

14. A plot of land was selected at Mádápura, and sown up. But I did not approve of the selection when I saw it, and while on tour through Coorg, I selected near Nittúr in the Kiggatnád Talook a piece of land which appeared well adapted to the purpose. It measures about 600 acres, and sufficient seeds have been collected for sowing up about 100 acres of it this year.

I regret to report that Mr. Hunter does not seem to understand the importance of carefully selecting and applying for land for sandal reserves; or in case of one application being refused, the greater necessity of at once applying for other plots.

Demarcations of Reserved Forests.

15. During my late tour in Coorg, I visited a number of forests with the view of selecting them as State forests; and in April last I submitted a complete list of such forests with their boundaries defined, for the purpose of a notification being issued reserving them.

16. There was however no necessity for putting off the preliminary demarcation of some of these forests, regarding which there could be no dispute : and in January 1870, I directed Mr. Hunter to commence the work. This he failed to do, and in my report for 1869—70 I had to report his remissness on this point to the Chief Commissioner. When out with Mr. Hunter in January and February 1871, I urged upon him the necessity of carrying out this work. The want of water during the hot weather precluded his at once commencing operations ; but he has received most stringent orders on the necessity of his now doing the work, and the progress made will be reported monthly to the Chief Commissioner.

17. The financial results are now exhibited, all annas and pies being omitted.

Receipts.		Budget Estimates.	Actuals.
I. Sale of timber brought to depôts		40,020	38,106
II. Do. removed by purchasers		6,000	6,423
III. Permit fees, rent of jungles, &c.		30,450	28,498
VI. Sale of fruits, minor products.		1,000	880
VIII. Fines and forfeitures.		300	160
IX. Miscellaneous.		1,230	
Total ...		79,000	74,067
Deduct Expenditure ...		25,000	24,557
		54,000	49,510
Deduct—			
Stock in hand at close of 1869—70	26,608		
Outstandings on account of sales at close of 1869-70	6,599		
Total...	33,207	...	33,207
			16,303
Add—			
Value of stock at close of 1870—71	25,701		
Outstandings on account of sales at close of 1870—71	10,910		
Total.....	36,611		36,611
Net Revenue...		...	52,914

Expenditure.	Budget Estimates.	Actuals.
A. Conservancy.		
I. Timber and sandal collection.	6,000	8,259
II. Purchase of stock, &c....	300	129
III. Feed and keep of elephants.	500	...
V. Charges connected with collection of revenue on grass, fruits, &c	200	...
VI. Plantation	4,000	5,956
VII. Forests work	300	11
VIII. Forest Survey	500	...
IX. Experiments to test value of timber, &c. ...	200	...
X. Communications and buildings	2,000	428
Total A	14,000	14,783
B. Establishments.		
I. Salaries	7,296	7,251
II. Travelling allowances	2,600	2,019
III. Contingencies...	1,104	504
Total	25,000	24,557

18. *Receipts—Decreases.* (i) The decrease is owing partly to the disappointment at the Hunasúru auction, (see para 5) partly to only 64 tons of sandalwood having been sold instead of 90 tons. Mr. Hunter exposed for sale a supposed quantity of 90 tons. The sale was held, and the money realized, but when he came to weigh it out to the purchaser he found that there were but 64 tons in all. A refund of Rs. 8,200 will therefore be made in 1871—72, but the money having been realized appears in the revenue for 1870—71. The explanation of this serious error will be given under general remarks.

(iii.) The total sum due for cardamom rents was not realized by the Revenue authorities.

(vi.) Sold for less than was anticipated, decrease being Rs. 120.

(viii.) A fluctuating item which it is impossible to estimate for accurately.

(ix.) No elephants were caught this year ; and no sums being realized from other items the whole (Rs. 1,230) is decrease.

Increases. (ii) A small increase of Rs. 423 was obtained by sale of wood on license.

19. *Expenditure—Decreases.* Under A, Conservancy and Working, a total decrease of Rs. 3,432 occurred under the following heads.

ii. Rs. 171, sufficient stock having been bought for Rs. 129.

iii. Rs. 500. No elephants were caught, and no cattle kept.

(v.) Charges connected with collection of revenue on grass, &c. The minor forest products were sold to a contractor who collected at his own expense. Hence no expenditure.

(vii) (viii) (ix) Rs 289, Rs. 500, Rs. 200, no work done.

(x.) Rs. 1,572. Mr. Hunter's remissness (see para 16) accounts for small expenditure.

Under B, Establishments, a total decrease of Rs. 1,226 occurred to small fines—less travelling allowances being drawn, and a smaller sum being required for contingencies.

Increases.—A total increase of Rs. 4,215 occurred under A, Conservancy and Working : under—

		Rs.
(i.)	Timber expenses	2,259 and
(vi.)	Plantations	1,956

These were however covered by savings under other heads ; and the actual total expenditure was within Budget estimates.

20. The items in return figured in para 17, are correctly classified, and entered in rupees only.

21. *Application for a supplemental grant.*—The orders of the Government of India on the estimated Budget for 1870—71, reduced the proposed expenditure under A, (i.) from Rs. 14,000 to Rs. 6,000. The fellings of both sandalwood and timber were reduced according to orders ; but there being a large quantity of old felled timber lying in the forests, exposed to damage, a supplemental grant was asked for in August 1870, which included Rs. 4,000 to pay for the removal of this wood. The orders regarding the supplemental grant did not reach me till the 6th April 1871, when the year having closed, the money had lapsed. The wood had however been brought in, and the sums due for it will have to be met from the Budget funds for 1871—72, unless a fresh grant is made.

The total amount asked for in the supplemental grant was Rs. 6,200; which included a sum of Rs. 2,190—2—0 due for the completion of the sandal kóti. This sum is also standing over from the same cause.

General Remarks.

22 In para 18, I referred to the *serious error* made by Mr. Hunter in calculating the quantity of sandalwood ready for sale. His explanation is that, as there is no sandal koti Daróga for the keeping of the sandal now stored at Fraserpété, the work of preparing and sorting sandalwood is simply supervised from time to time by the Manégár of South Coorg. That the old platform scales are out of order and incorrect, and that on making over the wood to the purchaser it was weighed in a large pair of English scales with correct weights, which he had borrowed for the purpose. He reports that there is no reason for supposing that any theft has taken place ; and it is certainly improbable that so large a quantity of wood could be moved through Fraserpété without being discovered.

23. The necessary sanction for the purchase of a pair of scales having been obtained, the kóti is now provided with a good pair. Mr. Hunter has been directed to make such arrangements as shall admit of the Manégar being at the kóti on fixed days, on which days only it will be opened for work.

24. I was enabled to visit Coorg during part of January and February 1871, my last previous visit having been in March 1869. During my late tour, I selected

the various forests to be set off as "State." I also inspected the office of the Assistant Conservator, and found his correspondence, receipt and despatch books were very much in arrears. The office copies of his returns and accounts were not kept neatly and carefully. He alleged in excuse the constant interruptions to work caused by the frequent illness of his one English Writer, combined with his frequent absence from head-quarters. I noticed that during a part of the year, the register books had been kept in Mr. Hunter's own handwriting. The Government of India refused to pass the expenditure for a second Writer estimated for in the Budget for 1871-72.

25. The whole of the Coorg forest and office establishments are, I consider, undermanned, and proposition statements for enlarging the establishments will shortly be submitted for orders.

26. Though but a small Province, Coorg is an important forest charge, and being at a distance from the head quarters of the Conservator, who has much work in Mysore, I think it advisable in the interests of Government to recommend that an officer of more matured age, be sent to Coorg, and that Mr. Hunter be transferred (in the same grade as that he now holds), to the Mysore Province, where he will be more immediately under the Conservator. Should the scheme for the management of the district forests in Mysore be sanctioned, more officers will be required, and the transfer could then be carried out.

27. CONTEMPLATED OPERATIONS.

(*a*). If the stock in hand of timber be got rid of, 500 logs of teak, 700 logs of honné, and 1,000 cartloads of branch pieces and other jungle woods will be felled and brought in.

(*b*.) About 60 tons of sandalwood will be collected.

(*c*.) The demarcation of State forests will be a work of primary importance; and will receive the Conservator's constant attention.

(*d*.) The extension of the Kármád plantations; and (if sanctioned) those at Kuttampollé. The pushing on of sandal reserves.

G. J. VAN SOMEREN,
Conservator of Forests in Coorg.

No. 21.

COORG FOREST DEPARTMENT.

Annual Summary of Revenue and Expenditure for the year 1870—7

Particulars.	Amount.			Remarks.
Receipts.				
I. Sale of timber brought to Depôt by Government agency	38,105	14	3	Compiled from the Assistant Conservator's monthly returns and the Superintendent's annual returns.
II. Do removed by purchasers	6,423	3	5	
III. Duty on foreign timber	...	...	...	
IV. Permit fees, &c.	28,497	7	4	
V. Grazing dues	...	...	...	
VI. Sale of fruits, &c.	880	0	0	
VII. Sale of confiscated drift and waif timber	...	...	...	
VIII. Fines and forfeitures	160	9	11	
IX. Miscellaneous receipts	...	...	...	
Total	74,067	2	11	
Expenditure.				
A Conservancy and Working.				
I. Timber expenses	8,25	3	11	
II. Purchase of stock	129	3	0	
III. Feed and keep of cattle	...	...	...	
IV. Rent of leased forests	...	...	...	
V. Charges in collecting revenue on grass	...	...	...	
VI. Plantations	5,956	14	6	
VII. Forest work	11	14	0	
VIII. Forest survey	...	...	...	
IX. Experiments on timber	...	...	...	
X. Communications and Buildings	428	12	11	
Total	14,786	0	4	
B. Establishment.				
I. Salaries	7,251	10	0	
II. Travelling allowances	2,019	12	1	
III. Contingencies	505	9	3	
Total	9,776	15	4	
Total Expenditure	24,562	15	8	

No. 22.

Annual Abstract Account of Cash Transactions of the Forest Department, Coorg, for the year 1870—71.

Dr. Cr.

Years.	Heads of Account.	Amount.			Year.	Heads of Account.	Amount.						
	To Cash balance in hand on 1st April 1870	17,157	10	0		By Expenditure of the Department	24,562	15	8	*Irrecoverable balance being Late Coates' forgeries.	9,099	12	4
	Revenue received	74,067	2	11		Remittance to State Treasuries	74,067	2	11	Cash to be accounted for and under enquiry	1,457	7	1
	Remittance from State Treasuries	21,023	11	2		Refunds of advances	149	2	1	Advances recoverable	3,512	0	0
						*Balance on hand on 31st March 1871	14,069	3	5	Total	14,069	3	5
	Total Rupees	1,12,848	8	1		Total Rs.	1,12,848	8	1				

No. 23.

Annual Statement of Outstandings and Liabilities of the Department on account of Contractors and other Disbursers for the year 1870—71.

Division or Province.	Departmental Debtor.						Departmental Creditor.						Balance due.						Remarks.
	At commencement of the year.			Recoveries in cash and value of supplies or work done during year.		At close of the year.			At commencement of the year.	Payments made during the year.		At close of the year.			To Department Outstandings.		By Department Liabilities.		
Coorg	...	...	...	15,887	11	6	15,887	11	6	17,157	10	0	12,799	4	11	29,956	14	11	14,069	3	5	...	...	...	
Frasérpété Sandal kóti	...	...	...	2,190	2	0	2,190	2	0	...	...	...	...	...	...	...	...	...	...	...	...	2,190	2	0	

COORG FOREST DEPARTMENT.

Statement showing the Number of Logs felled, sold, and remaining for the year 1870—71.

Description.	Remaining at the close of 1869—70.	Felled during 1870—71.	Total.	Sold during 1870—71.	Remaining at the close of 1870—71.	Remarks.
Teak	1,368	551	1,919	260	1,659	
Junglewood	583	114	697	249	448	
Branch pieces	147	...	147	42	105	
Total.....	2,098	665	2,763	551	2,212	

Stock Account of Quantities and Value of Timber and other Forest Produce on hand at the commencement and close of 1870—71.

Description.	In Depôt on 1st April 1870.				Add received during 1870—71				Deduct issued or sold during 1870—71.						Remaining in Stock on 31st March 1871.				Remarks.
	Quantity.	Probable Value.			Quantity.	Probable Value.			Quantity.	Amount realized.					Quantity.	Probable Value.			
Teak	1,368	20,610	0	0	551	7,163	0	0	260	4,773	7	9			1,659	21,567	0	0	
Junglewood	583	3,498	0	0	114	912	0	0	249	1,107	10	10			448	3,584	0	0	
Branch pieces	147	220	8	0	...	...	...	...	42	170	2	8			105	150	0	0	
Total.....	2,098	24,328	8	0	665	8,075	0	0	551	6,051	5	3			2,212	25,301	0	0	
					58¼ good wood.	18,640			64 good.	22,105									
					2 inferior.	64			2 inferior.	246									
Sandalwood	7 Tons.	2,280	0	0	60¼	18,704	0	0	66	22,351	0	0			1¼	400	0	0	
Total.....		26,608	8	0		26,779	0	0		28,402	5	3				25,701	0	0	

No. 28.

Annual Account of Forest Revenue for 1870—71.

Receipts	* 74,067	2	11
Deduct Expenditure	24,562	15	8
Surplus.....	49,504	6	3
Add amount in favor of the year as per particulars given below	315	0	0
Net Revenue.....	49,819	3	3

N. B. Besides the above, wood to the value of Rs. 3,478—14—4 was given this year free to Her Majesty's 8th Regiment, M. N. I., for building Regimental lines.

* Rs. 8,200 included, being sum paid in excess which will have to be refunded in 1871—72. See Para 18 of Progress Report.

Detail of Difference between Assets and Liabilities at the commencement and close of the year.

Particulars.	At commencement of the year.	At close of the year.	Difference. In favor of the year.	Difference. Against the year.
Value of timber and other stock	26,608	25,701	...	907
Outstandings on account of sales, &c.	6,599	10,910	4,311	...
Do on account of contractors, &c.	17,158	14,069	...	3,089
Total.....	50,365	50,680	4,311	3,996
Deduct against the year.....	...	...	3,996	...
Balance.....	...	...	315	...

Conservator of Forests' Office, Coorg,
Bangalore, 4th July 1871.

G. J. van SOMEREN, Lieut.,
Conservator of Forests, Coorg.

Mysore Government Press, Bangalore—1871.

APPEDNIX U.

PROGRESS REPORT

OF

FOREST ADMINISTRATION

IN THE

HYDERABAD ASSIGNED DISTRICTS,

1870-71.

By Captain W. DOUGLAS,

Deputy Conservator of Forests, Berar.

REVIEW BY THE RESIDENT.

No. 1406, dated 16th August 1871.

From—Captain R. Bullock, *Officiating Second Assistant Resident, Hyderabad,*

To—*The Deputy Conservator of Forests, Berar.*

I have the honor to acknowledge the receipt of your No. 401, dated 5th June, reporting very fully on Forest operations during the year 1870-71, and am desired to remark as follows :—

The principal measures carried out in the year under review are—

1. The partial demarcation of the Byraghur Forest.
2. The entire demarcation of the Geroo Mattergaon Forest.
3. The selection, and examination of State Forests on the Pemgunga, in the Bassim Sub-division, and at Kholapore and Pathroat in the Wun District.
4. Plantations and nurseries in the Mailghât.

The [illegible]i State Forest in Mailghât and Ghatboree Forest in Buldanah have not, it is [illegible], been visited by you this year, but you speak of visiting them shortly and after making some alterations, proceeding with the work of demarcation.

These forests, and those newly selected in Woon and Bassim should be entirely demarcated in the present year. Mr. Saunders is sure that the work will under the careful superintendence of the Deputy Conservator be rapidly and economically effected.

With reference to the Pathroat Forest in which you propose including an adjoining tract of mixed Forest on the ground that the present establishment will suffice for the care of a larger extent of Forest than is now reserved, Mr. Saunders thinks that on this ground alone would it be desirable to enclose any new land here, for the site is not reported on favourably, and no extra expenditure of any sort should be incurred.

Mr. Saunders is glad to perceive that you so clearly perceive the good policy of conciliating the wild tribes inhabiting the reserves, and he feels confident that their interests will be duly considered in all future measures, which may have to be adopted.

The experiment of preventing fires should, the Resident thinks, be carried on simultaneously with that of clearing off the grass, as the effect of interdicting fires was thought by your predecessor to be injurious to the young trees, which were choked by the grass. Whether the grass having been cut should be removed or left to rot on the ground to serve as manure is a question for your decision. You have pointed out forcibly the danger of fires in a thick forest, and some effective remedy should be devised. Would it be possible to clear the roads passing through forests where there is much grass, to a distance of 100 yards on each side, and fence them, and establish a number of cleared and fenced spots in the Forest where wood cutters could encamp and cook? This would diminish the risk of fires.

The plantations of 1869-70 appear to be in a flourishing state, and it is, as you observe, a great point that the plants have not required artificial irrigation. The experiments as yet are in favour of stored seed. You will, no doubt, see that the planting operations for this year are carried out with vigour.

The teak plantations in the Oomrawuttee District undertaken by the Deputy Commissioner of the District are interesting as experiments, and show a laudable desire to promote arboriculture, but from what you say Mr. Saunders does not anticipate they will prove practically valuable, and he thinks further efforts should be directed towards the extension and encouragement of those trees, such as Babool, Mhowa, &c., which, as experience has shown, thrive in the valley of Berar.

The sum expended on the tree plantation at Oomrawuttee is considerable, and Mr. Saunders trusts that you will, when occasion offers, inspect it, and give the District Officer the benefit of your advice, so that the plantation may not be allowed to suffer either from mismanagement or neglect.

Mr. Saunders does not anticipate much success from Bamboo planting, but the experiments made should be watched, and from time to time reported on.

In the year under review two measures have been instituted, which will affect the forest revenue considerably, namely, the reservation of certain kinds of timber, including Teak, in the unreserved Forests of the Mailghât, and the abolition of forest dues on timber imported from the Central Provinces, and you anticipate a considerable loss of revenue from this cause. To meet this you propose to institute working reserved forests cautiously, by clearing out old Teak stems which were

originally cut too high from the ground, and by utilizing trees other [illegible] leak trees, as opportunity offers, which, you however appear to fear will not find a [illegible] y market, as such a decided preference exists for Teak. The supply, however, of this wood will be now so curtailed, that customers will, the Resident does not doubt, be found for the other sorts of timber.

You also suggest that District Forests should supply, by an improved mode of working them, part of the deficient revenue. On this point you have addressed this Office in a separate communication a reply to which will contain the Resident's instructions on the point.

District Forests.

2. The whole question of District Forests is still in an unsettled state. If the Rules recently submitted to Government are sanctioned, the entire waste lands of Berar will constitute the District Forests. These are not directly in your charge, but with reference to those parts which are actually under Forest your advice will be of the utmost value to the District Officers, who will no doubt gladly avail themselves of it.

The principal object is to secure a supply of useful wood for firewood, building, and agricultural purposes. In the valley of Berar, clearance has been so great that at present only a few patches of Babool remain at wide intervals. To retain these, and arrange for their being carefully worked, is most important; and Mr. Saunders trusts that you will soon be in a position to lay before him some well considered measures with that object in view.

As regards extension of Babool Forests it is much to be feared that the most favourable sites have been cultivated, and that to take up land under cultivation will prove, as has been found at Akolah, too expensive an operation to prove remunerative.

The arrangements which have been made on the hills near Oomrawuttee have the Resident's full approval; they are in accordance with the Rules proposed for reserved District Forests.

In the Akolah District, in addition to the Babool Buns there is a considerable extent of hilly country to the south, running into and adjoining the Buldanah and Bassim Districts: the produce of this tract is taxed at a line of nakahs at the foot of the hills. With reference to this line of nakahs as shown on the map it is not quite clear how the District Forests of Bassim, and more especially Buldanah are protected to the south. Apparently any amount of Forest produce may be taken away free on that side across the frontier; for instance, to Jaulnah or Hingolee. Some information on this point is required.

A reference has been made to Government on the subject of the guard at Chickuldah, the reply to which will on receipt be communicated to you.

The financial results of the year may shortly be summed up, as showing an increase both in income and expenditure. Both increases being due to an improved and more expensive system of taxation.

You show an increase of expenditure of only Rupees 4,989-3-10, but in reality it is more, as you have increased the charges of last year by a large sum paid as compensation to Mailghât Rajahs—an exceptional and not a recurring annual charge.

Mr. Saunders trusts that every endeavour will be made to reduce the amount of outstandings due to the Department.

In conclusion, I am desired to express to you the Resident's entire satisfaction with the manner in which you have conducted your duties since you joined. He

has seen [illegible] special approval how liberally you have met all suggestions of the Civil Ofd[illegible] or measures to lighten the weight of Forest imports on the public, and he has to thank you for some valuable reports.

To Mr. Drysdale, Assistant Conservator, and Mr. Ballantyne, Forester, you are requested to convey an expression of Mr. Saunders' satisfaction at the services which they have rendered.

The Forest Department in Berar is still as it were in its infancy and much remains to be done to develop it into maturity. It is a subject of congratulation that it possesses officers uniting zeal with ability and experience, and Mr. Saunders is confident that the current year will see much done to put it on a par with other provinces.

DEPUTY CONSERVATOR'S REPO]

Annual Report, dated 5th June 1871, *on the management and conservancy of the Berar Forests for the Financial year* 1870-71, *by Captain* W. DOUGLAS, *Deputy Conservator.*

I HAVE the honor to submit the annual Forest Report of the Hyderabad Assigned Districts, for the year 1870-71, and in doing so, have endeavoured to adhere to the instructions laid down in the Circular No. 8-F., Government of India, dated 4th November 1868, dealing with the various subjects in the order therein noted and separately as regards the Northern and Southern Divisions.

2. I also beg to append a rough Sketch Map for facility of reference in discerning the localities of the various Forests named, and though I have not had time to finish it very carefully, it will I trust serve the purpose for which it is intended.

INTRODUCTORY REMARKS.

Statistical data.

3. The statistical data of the province being comprehensively given in the Berar Gazetteer, it appears unnecessary for me to enlarge on this subject, I therefore confine myself to a brief sketch of the various forest localities, and their position as regards the Berar Plain or the Valley of the Purna, which comprehends the sites of the principal towns and wood markets.

General features of the Province.

4. From the sketch map the natural features of the province, so well described in the Gazetteer may be recalled, the "Payanghat," or low land which comprehends the Purna Valley bounded on the north by the Mailghât Talook, and on the south by the Ballaghat, or hill tract, which runs through the Districts of Buldanah, Bassim, and Woon, designated Ajanta range.

5. With the exception of the Baboól buns and the numerous luxuriant groves studded throughout the Payanghat or Purna Valley which give it in various parts a very pleasing and park-like appearance, no timber of any value exists, the country is generally extremely fertile and well cultivated, containing many large and populous towns which draw their supplies of wood from the Mailghât hills on the north and the Ajanta range on the south, these containing properly speaking the whole forest area of Berar.

Northern Division, Mailghât Talook.

6. Many detailed descriptions of the Mailghât having already been given, I do not propose here to advert at length to its general character, it may however be useful to bear in mind that the chain of hills along the south of the Mailghât, forms a complete barrier between the Valley of the Purna and that of the Taptee which is only passable by tracts (generally known as kurrass roads) formed by continual traffic in the export of timber from the hills by "Kurrass," that is, dragging wood from the forests, by means of a pair of bullocks attached to the timber simply by a rope fastened to the yoke.

7. All these roads are extremely difficult and rough being quite impassable for wheeled carriage, two of them are, however, less so than the others, *viz.*, those which debouche at Jirre and Damungaon, each of these places having in consequence become a large timber mart.

8. The interior of the Mailghât then, especially towards the north and east, can best be remembered as a series of rough basaltic mountains intersected by deep ravines through which flow the several confluents of the Taptee, the basins of which have long been especially noted for their teak bearing qualities. These are the Gargu and Doolar, the Seepna, Kapra, Narpa, and Kundu rivers. Again, from Byraghur on the north-west following the course of the Taptee in a south-westerly direction, large plains of rich black culturable soil open out between the hill ranges, presenting in their cultivation a striking similarity to those of the Purna Valley.

Mailghât [illegible]es.

9. The two tracts in the Mailghât marked in green color on the map represent the localities which have been selected as Government forests, the larger including almost the whole north-east portion of the Mailghât named the Byraghur reserve. I estimate roughly to contain an area of 400 square miles, the smaller comprehending the tract which is bounded by the Gargu and Doolar rivers, named the Katkali reserve, estimated at 150 square miles.

State Reserves in Northern Division.

10. In the northern forest division, which it will be remembered comprises the Districts of Ellichpore, Oomrawuttee, and Akolah, these may therefore be considered the principal forests, though a tract east of Oomrawuttee, shown on the map in red color, which has for long been the chief source of supply of firewood and grass to that city has been selected and retained under the District Officer for the above purpose.

Proposed Babool Reserves.

11. It was also proposed to take up as State reserves, certain Babool buns at Lonee near Akolah, and also some of these tracts situated in the Purna Valley, the positions of which are marked in yellow color, but as all these will be adverted to hereafter in detail, I merely mention them in explanation of the map, and when I point out that the towns prominently marked along the foot of the Mailghât hills by a black point enclosed by a red circle, denote the line of bazars for the taxation of forest produce along the Mailghât hills, I shall have, I believe, completed all necessary detail for the northern division.

Forest Tracts in the Southern Division.

12. I have stated that on the south of the Purna Valley or "Payanghat," the Ajanta hills contain the chief forests and form the watershed between the Purna Valley and that of the Pem or Pain Gunga river, which defines, almost throughout the southern boundary of the Assigned Districts. This range occupies the whole southern portion of the Buldanah District, the whole of Bassim, and with the exception of the Wurda valley on the east nearly the whole of Woon, the three districts forming the southern forest division.

General character.

13. This range of hills does not present the same bold aspect and wild scenery found in the Mailghât, they are generally low, with steep slopes and surmounted by table lands, which in many parts are very extensive and occasionally cultivated, on the slopes of the ravines and hill sides scrub jungle and brushwood abound, sometimes mixed with large trees in parts assuming the character of forest, and thus, belts of wood-land are frequently found to interlace with extensive plateaux, partially cultivated, without affording any extensive and continuous forest tract. Nearly the whole of this part of the country is of basaltic formation, and to a great extent covered with loose trap boulders which renders exploration among the hills a work of considerable labour and fatigue.

State Forests of the Southern Division.

14. The forests of Ghaut Boree and Geroo Mattergaon in the Buldanah District as shown on the map have been selected during the preceding season by my predecessor, and the localities marked green in Bassim and Woon have been proposed as reserved forests, constituting the entire areas which it appears desirable to retain as State forests in the southern division.

Revenue Posts.

15. A line of nakahs for the collection of seigniorage is also shown on the map, along the foot of the Ajanta range, similarly to those at the foot of the Mailghât hills.

Forest Legislation.

16. During the past past year no fresh measure has been introduced and the forest rules drawn up by Major Pearson in 1868, which have received the Resident's sanction still continue in force. During the year under report, however, a fresh set of rules compiled for the forests of this province were received from the Inspector General of Forests and reported on, but it is believed these rules, in the matter of their definition of, and proposi-

tions regarding district forests, had not the concurrence of the Local Government, and consequently further action in the matter has been delayed.

Special rules for Buldanah District.

17. During the year, however, subsidiary rules proposed by Mr. Strettell for the Buldanah District have, under the Resident's sanction, come into force.

Special rules for Akolah, Bassim, and Woon Districts.

18. Rules for the Akolah District have likewise received the Resident's sanction. Subsidiary rules have also been proposed for the forests in Bassim and Woon* Districts, though in consequence of certain difficulties regarding the system of revenue collection in the district forests, issue of the rules has been delayed pending the introduction of some more suitable arrangement. I may also add that the same difficulty applies to the Buldanah rules which have been published, and it appears to me that the basis of this difficulty rests exactly on the same grounds I have adverted to with reference to the forest rules which were received for report from the Inspector General of Forests.

19. An authoritative definition of district forests and the rights of the Forest Department in them applicable to the Hyderabad Assigned Districts is, therefore, an important want, which I trust will be supplied ere long by the issue of forest rules, and which will greatly tend to the progress of this department. It is hoped, however, that an early arrangement will be effected with reference to the subsidiary rules referred to, which will suffice for present purposes. This, however, forms the subject of a separate correspondence.

PART I.—SPECIAL.

Head I.—Section I.

State Forests and Forests leased by the State.

20. From the sketch map which I have appended, a general idea of the distribution of the State forests proposed and demarcated may be apprehended, and these I enumerate as follows prior to reporting in detail the operations undertaken with regard to each. Total area now reserved as State forests and proposed for reservation amounts to 550 square miles in the northern division; 231 square miles in the southern division; 781 square miles, being the estimated area for the province.

List of State Reserved Forests in the Hyderabad Assigned Districts.

Number.	Names of Forest.	Estimated area square miles.	Remarks.
	Northern Division.		
1	Byraghur Forests	400	Demarcated, but boundary under revision and alteration.
2	Katkali "	150	Not demarcated.
	Total...	550	
	Southern Division.		
3	Geroo Mattergaon Forest	75	(Booldanah District.) Demarcated.
4	Ghat Boree "	25	Not demarcated.
5	Pem Gunga "	70	(Bassim) not demarcated.
6	Khalapur "	50	(Woon District.) Not demarcated.
7	Patroat "	10	
8	The small tracts of Mangla, Jaolgaon, Renkapur and Dapura	1	
	Total...	231	
	Total of both Divisions...	781	

* Note.—Since writing this I have been informed that my Report on the Woon District has not reached the Resident's Office, the dak having been plundered in the Nizam's Territory.

NORTHERN DIVISION.

Byraghur State Reserve.

21. Demarcation of this forest was reported by Mr. Strettell as being nearly complete, except at one point where he had applied for an increase of land for inclusion.

System of demarcation.

22. On examination of the system of demarcation proposed by Mr. Strettell, however, I found it hardly so complete in all particulars as I should desire, for instance, boundary marks were erected, though no line was cleared to connect them, also the expedient of marking trees intervening between boundary pillars did not appear to me a sufficiently plain method of demarcation, as well as that the system of inscribing boundary posts with either a carved or painted number, seemed capable of being improved upon, and I have therefore, with the Resident's sanction, ordered that the system of demarcation described in Appendix marked A. be introduced for all State reserves in Berar, and as this varies very slightly from that proposed by Mr. Strettell for the reserve in question, the only one on which work had been begun comparatively little labour would be lost.

Alteration of boundary marks

23. The boundary of the Byraghur forest had been originally demarcated in a rough manner by Captain Mackenzie, then Assistant Commissioner in charge of the Forests, though, at the suggestion of the Inspector General of Forests, a revision of the boundary was made by Mr. Strettell, who directed several changes. In process of my demarcation work, however, it was reported by my subordinates that a portion of Captain Mackenzie's reserve containing promising young teak had been inadvertently excluded in the new demarcation, and I therefore, after examining the tract, decided that this portion of the forest should be resumed, having then obtained the assent of the civil officers to my proposal. I have sent a report defining the change I proposed through the Deputy Commissioner, Ellichpore, for the Commissioner's sanction. This Report will be afterward submitted. In other respects the boundary fixed by Mr. Strettell has been adhered to.

24. The extent of the tracts thus resumed I estimate at 50 square miles, which added to the area formerly calculated by Mr. Strettell, 350 square miles, amounts to an area of 400 square miles.

Progress of Demarcation.

25. From what I have said it will be seen that the boundary path of this reserve cannot as yet be styled complete, though at present a sufficiently clear temporary demarcation has been made to insure its being quite unmistakable, and I hope to complete the demarcation fully on the system noted early this season. During the past season 35 miles of boundary path have been cleared at a cost of Rupees 493-14-0, and 467 pillars erected at different intervals according to the nature of the ground which affects the cost of operations in demarcation to a very marked extent.

Katkali Reserve.

26. I regret that my time, which has been much occupied since my arrival in Berar, in the inspection of forests in other districts, has not admitted of my examining this tract before the close of the official year, I propose, however, proceeding there shortly with a view to arranging for its demarcation without delay. In the meantime I have deputed some of my establishment to explore and obtain information of the locality and forest it contains prior to my proceeding there in person.

Babool Tracts proposed for reservation in Akolah District.

27. In addition to the two tracts I have named I must now refer to certain Babool buns in the Akolah District, which were proposed for reservation as State forests by my predecessor, *viz.*, Lonee near Akolah, and several detached Babool buns in Purna valley which he proposed to unite by plantations.

28. Having visited these tracts during the season, and having carefully gone into my predecessor's plans regarding them, I concluded that as the proposal involved the outlay of a large sum as compensation for land to be taken up to form these buns into united blocks of a compact form, and that no immediate return would be obtained from them, further, that they are now reserved under the District Officer and protected by his staff, and that they can be resumed hereafter on equally advantageous terms, also that their present resumption would entail the cost of another establishment besides the loss of the land revenue of the cultivated areas which would require to be taken up to carry out the scheme. Having also in view a proposal to work the whole Babool buns in these provinces on a regular plan, with the object of affording a certain annual supply of wood from them, I have obtained the Resident's sanction to hold this scheme in abeyance for the present, until further experience enables me to see whether more profitable arrangements cannot hereafter be made.

Oomrawuttee Grass and Firewood Tracts.

29. I now refer to a tract in the hills east of Oomrawuttee from which that city has for long derived its supplies of grass, firewood, &c. This tract was originally divided into five blocks which were worked in rotation, one each year; the jungle upon it is however very much exhausted, indeed it contains nothing but the veriest scrub which it would be quite useless to reserve as a Government forest. It has always been under the District Officers and treated as a district forest, seeing therefore no reason for present alteration of the existing arrangements, I have agreed with the Deputy Commissioner that all the waste lands contained within the original block, be reserved from lease, except those granted by his special permission, and the arrangement having been approved by the Commissioner a list of the villages comprised within this tract have been forwarded to the Survey Officer with a view to the scheme being carried out.

30. The tract is, therefore, held as a district forest, and no further demarcation than the village boundaries is at present proposed. I may add that a great portion of the land is excessively barren and unfit for cultivation, I am of opinion, however, that babool plantations might be tried in certain portions of it, though generally I must give it as my opinion that the soil of the greater part is too sterile to afford good timber forest, the advantage however of retaining it as a firewood and grass reserve for supply of the town is great as well as profitable in a revenue point of view.

Southern Division, Geroo Mattergaon.

31. This forest was selected by my predecessor and sanctioned during the past year. It is situated on the Ajanta range of hills in the east of the Buldanah District. Demarcation was commenced by Mr. Drysdale, on the system approved by the Resident, during the past year, and I have just received his report of completion of the boundary posts and clearing the boundary path which comprise the most important items of this work.

Demarcation of Geroo Mattergaon State Reserves.

32. From Mr. Drysdale's Report above noted I remark the following particulars. The approximate area of the reserve is estimated at 75 square miles, bounded by a path about 42 miles in length, with 93 pillars. The cost of this work amounted to Rupees 869-8-6. This forest is described to contain Unjun (Hardwickia Binata), and Teak (Tectona Grandis) in fair quantity, the former being also a useful good wood.

Description by Mr. Drysdale.

33. Not having, however, had an opportunity of visiting this forest, I quote a description of it extracted from Mr. Drysdale's annual report:—

" It may almost be termed a pure forest of Unjun, this being everywhere the " staple wood, although it contains in small quantity, but of inferior growth, trees " of nearly every other description common to Berar. Teak is perhaps the most " plentiful of these other varieties, and is to be found chiefly skirting the plateaus

" to the south, and in the ravines leading down from here into the Ghan and Iswa " valleys. It consists entirely of shoots from old stumps, but many of these spring " direct from the ground, and have separate roots of their own, and may, therefore, " be expected to develop into trees in time.

" Geroo Mattergaon may be considered one of the most promising reserves in " Berar. It contains very equally distributed throughout its whole area numerous " full grown trees, which though stunted, gnarled, and crooked, from the frequent " lopping and ill-treatment they have formerly been exposed to, are yet most valu- " able in their present state for the production of seed. In no forest in Berar " have I yet seen so much reproduction as is to be found here.

" On the plateaus, as well as in the valleys and slopes of hills, seedlings are " almost everywhere to be met with, and if for a few years we can only succeed in " keeping out fires, there is every reason to hope we shall soon have the entire area " of forest land covered with as promising a crop of young wood as could possibly " be desired; and as you are already aware, it is only from an entirely new crop, " carefully raised and nurtured, that we can expect the forests in south Berar to " become valuable, the trees now existing being fit for little else, but standards " for seed, and nurses for the shelter and protection of seedlings.

" Many of the present young Unjun trees have apparently from over-rapid " growth become top-heavy, and have in consequence lost their leading shoots, and " formed a spreading habit, thus giving them as it were a short and stunted ap- " pearance.

" This I cannot suppose to be natural habit of the tree, and it may be expect- " ed to disappear, as new seedlings spring up, and the ground becomes covered " with a denser growth of wood."

Injured Trees.

34. Mr. Drysdale I observe particularly notes that the old trees in this forest have suffered severely from former ill-treatment, though he speaks highly of the character of the forest and the abundant reproduction it seems to contain. The extent of cultivation included in this reserve is believed not to exceed three square miles.

Map forwarded.

35. A map showing its demarcation received with Mr. Drysdale's annual report is also appended.

Ghat Boree State Forest.

36. Demarcation of this forest has not yet commenced. Its proposed area is estimated at 25 square miles, though it is reported to contain a much larger cultivated area than Geroo Mattergaon forest, in fact my intention is to desire Mr. Drysdale to revise the tract selected, and in demarcation to exclude as much of the cultivated area as may be possible without undue sacrifice of forest covered land. Probably I may before long be able to visit the locality myself also with a view to effecting the above object.

Description

37. This tract being situated in the same range of hills, and only 15 miles distant from that just described, its character is almost exactly the same as regards timber, generally it is reported to contain a large admixture of teak, but the quality of the timber is hardly equal to that produced in Geroo Mattergaon.

Pem Gunga Reserve.

38. In the Bassim District a tract which it is proposed to designate the Pem Gunga reserve was selected by me during my tour last season with the Divisional Forest Officer.

Situation

39. This tract includes a portion of the Pem Gunga valley and the hills lying to the north-west of Kanapore between that village and Hausing, the nearest portions of it are within 15 miles of Bassim to which market an easy route for export of its produce can be found.

Extent.

40. Its extent is roughly estimated at 70 square miles, but it must be remembered that this area includes several villages and their cultivation which it was found impossible to exclude, and at the same time to reserve the wooded lands in a consecutive tract. It is therefore calculated that the cultivation amounts to about one-third of the whole, say 25 square miles, and that the remaining 45 miles may be taken as the net forest area.

Cultivation with its limits.

41. It is proposed to treat the cultivation thus included within the reserves on the plan elsewhere described, which has been deemed by both my predecessor and myself in consultation with the civil officers as the best means of securing Government interests, alike as regards the forest and land revenue departments.

Timber produced.

42. Teak is the valuable timber produced in this reserve, it is generally interspersed however with other kinds of trees common to this part of the country, of the reserved and unreserved sorts marginally noted.

Jumrassee (Iliodenron Paniculatum)
Bel (Aegle Marmelos.)
Lokundie (Ventilago Madraspatana)
Lendya (Lagerstroemia Parviflora.)
Pallas (Butea Frondosa.)
Dhobyn (Acacia Paniculata)
Tendoo (Dyospyros Ebenum.)
Suj (Pentaptera Tomentosa.)
Mersinghee (Spathodea Arcuata.)
Aonla (Phyllanthus Emblica.)
Gugul (Commiphoroe Madagascurenis.)
Puddool ?
Tewus (Dalbergia Oojeinensis.)
Ruggut Rora (Tocomma Undulata)
Gondee Dhamin ?
Dhamin (Grewia Tiliaefolia.)
Seewan (Gmelina Arborea.)
Pangra (Erythrind Indica.)

Character of the Teak.

43. The Teak, however, is small, and generally consists of saplings produced from old stems, it is however found in considerable quantity, and though in itself, the present crop cannot be considered valuable, yet the seed annually yielded by the existing trees affords prospect of good reproduction which, under careful protection and conservancy, will, it is hoped, in course of time assume a more valuable character.

Report formerly submitted.

44. A detailed report of the selection of the above forest was submitted through the Commissioner, West Berar, in this Office Financial No. 676, of 30th December 1870. I now proceed to notice the tracts selected for reservation in the Woon District by Mr. Drysdale and myself.

The Kholapur Forest.

45. This forest, like the preceding one, is situated on a low chain of hills, very rough and covered with trap boulders, which forms a spur of the Ajanta range and runs southwards to the Pem Gunga river.

Extent and situation.

46. The extent of the proposed forest is estimated at 50 square miles, and from its being situated comparatively in a more remote portion of the district, it is believed that the cultivated area which it will be found necessary to include within forest boundaries is comparatively small, and requires no special mention here.

Teak produced.

47. Teak is the most valuable timber contained in the tract. In character it much resembles that of the Bassim District, being chiefly coppice produced from the stumps of trees formerly felled, it also appeared very partially distributed in spots and belts throughout the whole forest area, generally preferring the ravines and lower slopes of the hills where the soil appeared suitable. The other portions, however, contain jungle and forest trees of a very mixed character, among which the Salai (Baswellia Thurifera) is very prevalent, and though in portions of this tract reproduction appears good, the character of the forest generally did not seem very promising, however taking it as a whole, in comparison with the forests of this part of the country generally it was in my opinion the most suitable for reservation.

Other Trees.

48. Other trees of the sorts noted with reference to the proposed forest in the Bassim District, likewise grow here, with a luxuriance proportioned to the fertility of the soil, and the other circum-

stances which affect the production of timber. Though none of them are so valuable as teak, and many of them are comparatively worthless, it becomes necessary to avail ourselves of every natural growth of wood produced, in endeavouring to improve the character of the forest, the fact alone of its covering the ground by its shade and retaining moisture near the surface by the action of its roots renders the future introduction of more valuable woods an easier matter.

Report.

49. The proposal to reserve this tract was made in my No. 110* of the 16th February last, submitted through the Commissioner, East Berar.

Patroat Forest.

50. This forest is situated about 20 miles east of Yeotmahl on the Gokee river, a tributary of the Aran. It was visited by Major Pearson in the year 1863, and the area of the forest as estimated by him amounts to 5 square miles, I have, however, suggested that an adjoining tract of mixed forest should, if approved on further inspection by the Divisional Forest Officer when proceeding to lay down the boundaries, and, if no objection on the part of the Civil Officers exists, be added to the forest which would then make up the area to 10 square miles, my chief object in proposing this increase of the tract is that the same protective establishment which would be required for the smaller area could easily look after the larger, and it would doubtless yield some revenue of a miscellaneous nature even though it was poor as a timber forest. I however desire this recommendation to be considered dependent on the subsequent report of the Divisional Forest Officer who arranges the demarcation.

General Character.

51. The character of the forest generally is well described in Major Pearson's report, and I fully concur in the low opinion he forms of the productive powers of the soil in Patroat.

Trees formerly cut.

52. The old trees he mentions were subsequently cut out for a sleeper work, and I am informed produced a very poor return of timber.

Character of the Forests in South Berar.

53. It will, however, be observed that the forests throughout the whole of the Ajanta range appear to possess but very indifferent capabilities of timber production, and in selecting those which have been recommended, the sites have been chosen as affording the greatest hope of improvement, though had the localities contained tracts of better promise as regards soil, reproduction, and other advantages, I should have recommended reservation on a much more extended scale. I think, however, that the areas proposed are quite sufficient for present purposes, though I fear they can hardly yield much timber or produce for many years to come.

Superstition regarding Patroat Teak.

54. The teak in Patroat forest and in several detached patches subsequently adverted to have been originally preserved on the supposition of its being considered sacred to the Goddess Dabee. The prejudice I believe still to a certain extent exists, and has interfered with the sale of the remnants of wood stored there which are deteriorating yearly, and would have been disposed of ere this had purchasers been forthcoming.

Detached portions of Teak at Mangla, Jaolgaon, Renkapur and Dapura.

55. I have proposed reservation of these small detached teak tracts, aggregating about one square mile in extent, chiefly with a view to experiment in felling and natural reproduction, as they are the only wooded tracts in this division containing teak of any size, or at all approaching maturity.

Continued.

56. They possess however throughout a fair proportion of straight well grown wood standing sufficiently closely to

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Lost in Dâk as before remarked.

form the basis of useful experiment, and might possibly be capable of extension by plantation hereafter if it were deemed desirable to do so.

HEAD I.—SECTION II.

57. This section deals with the requirements of the population surrounding the reserves and the prescriptive rights they possess in them.

Forests in the Mailghât.

58. In connection with the Byraghur forest in the Mailghât this has formed the subject of a special report, and I shall therefore only recapitulate briefly the views I have therein expressed, as regards existing cultivation included within the reserved forest limits, its extension, and the privileges enjoyed by the people.

59. In addition to the description I have already given of the wild mountainous region known as the Gangra or Mailghât, it should be borne in mind that the Byraghur reserve comprehends an area estimated at 400 square miles of the roughest and most inaccessible portions of this tract which is peopled almost entirely by the Koorkoos, and that as a rule the inhabitants of the plains can never be induced to settle there on account of its unhealthy climate, in fact the certainty of illness is so great, that they rarely make any but the shortest visits compatible with their business.

60. The population of Koorkoos is small in comparison with the area, and from what has already been said, it will be seen that every effort should be made to retain their presence in the reserves, and that depopulation would be, either from a forest or a revenue point of view, the greatest calamity that could well befall the administration of this tract.

61. The habits of the people are well known as regards cultivation, especially in the high table lands and open flats which everywhere interlace with the forests, and which, in order to preserve the whole valuable timber bearing region, it has been found necessary to enclose. As the soil is of a light and barren character, and becomes exhausted in two or three years' cultivation, the Koorkoos are in the habit of selecting fresh fields, leaving the old ones, often for an indefinite period, to regain their fertility. In the same way villages break up into danahs and move about to suit their own tastes and convenience, the extent of available land being so great that they can do so without affecting the interests of their neighbours, or, at present, those of the forests.

62. Further the Koorkoos used to supplement their means of subsistence by the felling of teak for sale at the bazars at the foot of the Mailghât hills. This practice within reserves has long been stopped. Dyah cultivation is also prohibited. It will, therefore, be noted that the introduction of Forest Conservancy has necessarily deprived this race of two material privileges which they valued highly, to make no mention of minor inconveniences which cannot fail to be in a measure felt, such as the surveillance of the Forest Establishment, &c.

63. They are however allowed for home consumption an unrestricted amount of all wood except Teak, Tewus, and Sheshum, and also forest produce though not for sale or export to the bazars.

64. Experience has nevertheless shown that although the Koorkoos are not given to complaining, and carefully avoid rendering themselves liable to legal action, they will not brook infringement of their rights, and at once adopt the remedy of removal to some other place where they can enjoy more freedom of action, the necessary consequence, therefore, of any severe measure, or the introduction of any restraint on cultivation, or restriction of village limits within reserved forests, would at once result in their depopulation.

65. In dealing with this subject, and its practical application, my recommendations have been that the least possible interference with the existing customs of the Koorkoos be attempted, and that if restriction within reserves be limited to the following points, present necessities will be met:—

1*st.*—Cutting of all wood for export or sale.

2*nd.*—Dyah cultivation.

3*rd.*—That persons wishing to change the position of their cultivation or village should first obtain the consent of the Forest Officer, and as abundance of land is available without injury to forest interests, that every facility be given for occupation of fresh land when required.

66. It will be seen that if laws and restrictions are at once strictly enforced within the reserves the whole population will desert to the unreserved forests, and it therefore becomes necessary to grant a certain compensation in liberal dealing for the restrictions which Forest Conservancy imposes within reserves. In all cases it will, I think, be found to the interests of the department to subsidise this wild race by liberality of treatment, with the object of ensuring the various advantages obtainable from their presence in the forests, such as protection from depredations of outsiders, supply of labor, &c., in fact, it appears to me that the true objects of Government will be most fully attained by assimilating their interests with those of the Forest Department rather than by placing them in antagonism to our views, and forcing upon them rules the spirit of which they would consider vexatious and irksome.

67. I therefore suggested continuance of the present system which provides for all the restrictions which appear to demand immediate attention, and consider that any change should be gradually introduced when circumstances point to the necessity for it. I believe that great harm might be done by a rigorous over-zeal in anticipating such necessities before their occurrence.

68. Virtually then the inhabitants of the reserved forests in Mailghât at present enjoy the same privileges in supply of their personal wants as those who dwell beyond forest limits. Teak, Tewus, and Sheshum having lately become restricted woods throughout the Mailghât. In the matter of cultivation they must obtain permission before breaking up fresh land, though no restriction is thrown in the way of cultivation in situations which are not properly speaking covered with forest. The revenue from cultivation is collected by the Civil Department, and this appears no disadvantage, as their welfare thus obtains the consideration of both the Civil and Forest Departments from which it is perhaps less likely to suffer unadvisedly.

Regulation of cultivation in other reserves.

69. The principles regulating cultivation in other reserves which have been taken up or proposed, may be briefly enumerated as follows, from what has been already said with reference to those reserves especially, the impossibility of selecting such tracts in sufficient consecutive area without inclusion of cultivation will have been gathered.

I.—All existing cultivation within reserves remains uninterfered with by the Forest Department, while the Civil Department collect the revenue.

II.—Extension of cultivation in reserved forests to be admitted at the discretion of the Forest Officer, culturable land being surveyed in the usual way will be leased provided his consent is obtained.

III.—The revenue of all land leased for cultivation to be credited to the Civil Department, while that of all unleased lands to Forests.

IV.—Timber for constructive purposes and firewood for trading purposes to be supplied on application to the Forest Officer at the prescribed rates. Firewood for home consumption to be granted on the terms applied in District Forests.

V.—The Forest Department to have the power to close to grazing and place under strict conservancy such portions of the forest as circumstances may render desirable.

70. The above principles are believed to have the approval of the Commissioners of East and West Berar for application to selected and proposed reserves, and they appear to me sufficient for present purposes. Modification hereafter being made in accordance with such rules as may issue in conformity with the proposed Forest Act. They are likewise applicable to the Southern Division.

HEAD I.—SECTION III.

Protection.

71. Financial Resolution by the Government of India Public Works Department No. 440-F., dated Simla, 13th August 1870, contains the revised scale of sanctioned Forest Establishment for protection of the State and District Forests, they are distributed according to the various forest charges under District and Forest Officers to which they appertain, details of which have formed the subject of separate correspondence.

Bazar and Grazing Establishments.

72. The bazar and grazing establishments have, as directed in the Resolution above quoted, been retained on a temporary footing subject to the Resident's sanction, and I am of opinion that this arrangement is perhaps the most suited for present circumstances, as the amount of revenue collected would, I presume, always be considered the basis on which the expediency of retaining these establishments would depend.

Darogah for Southern Division.

73. During the past year the appointment of an additional Darogah, Sillamon Khan, was, at my request, sanctioned by the Resident, to aid the Assistant Conservator in the supervision of the Revenue posts and State forests in the Buldanah District, the urgency of this appointment will be apparent, as prior to it that officer had no forest official on higher pay than Rupees 15 per mensem to assist him in supervising his establishment, and discharging the various duties which claim his attention in the three districts composing the Southern Division.

74. In addition to the permanent establishment sanctioned in Government Resolution No. 440-F. above quoted, it has been found necessary to retain on a temporary footing the establishment shown in the appended list for the purpose of collecting duty in the hills east of Oomrawuttee, its discharge would have caused great loss of revenue, and as the collections of the present year Rupees 40,465-3-10, in comparison with Rupees 22,956-9-0 the collections of the past year, show an increase of Rupees 17,508-10-10, I trust expediency of the measure will be apparent.

Departmental Guard.

75. Sanction to retain the guard for the protection of the cash chest, office, stores and Government buildings at Chickulda, which have been purchased for the use of the department, has also been applied for, and is also urgently necessary. The prevalence of annual fires in spring, alone renders the utmost vigilance requisite to ensure the protection of buildings, in addition to this it is necessary to leave at head-quarters many office records, the cash chest and also stores, forest tools, &c., &c., as however this has been explained in former correspondence, I need not enlarge upon the subject further.

Probable changes required.

76. A few additions and changes will become necessary in the Bassim and Woon Districts on assumption of the State forests proposed there, propositions were submitted on this subject, with the Reports sent in by me, but these might possibly be modified when the other arrangements regarding these forests have been satisfactorily concluded. A temporary establishment has also been entertained for protection from fire of the tract in the Byraghur reserve named the Raipore Block, which will be adverted to hereafter.

77. A list of the various permanent and temporary establishments is appended—*vide* Appendix B.

Forest Offences.

78. I append a list of forest offences received from the various Deputy Commissioners; my experience here and formerly correspond with the remarks made by my predecessor in last year's annual Report, and I am inclined to think that it is only in exceptional cases Forest Officers can advantageously exercise magisterial powers. The difficulty also in establishing a satisfactory proof of forest offences is also very great, as unless taken in the act by more than one witness, it is nearly impossible to convict in the face of the many plausible explanation, which are freely afforded.

Remarks.

79. On the whole, however, I am inclined to think that the people in Berar pay great attention to orders issued by the District Officers on forest matters generally, and that the exercise of this influence has a beneficial effect in assisting Forest Conservancy.

HEAD I.—SECTION IV.

MANAGEMENT AND IMPROVEMENT OF THE FORESTS.

NORTHERN DIVISION.

Byraghur Forest, Mailghât.

Thinning.

80. No thinning operations have been undertaken during the past year, as the teak it contains is too sparsely scattered to require this operation.

Pruning.

81. Pruning is also unnecessary, except in the young plantations where the removal of a young shoot or a double top to a sapling would be beneficial, beyond this, however, I agree with my predecessor in the assertion that the character of the trees could not be improved by it.

Clearing the Jungle of useless underwood.

82. During the past year nearly 30 acres of natural forest were cleared of useless undergrowth with a view to improving the character of existing trees and by the admission of light and air of encouraging the germination of young teak.

83. This operation was executed under supervision of Mr. Ballantyne, who reports favourably of its effect. I myself visited the spot subsequently, and in concurring in the utility of the operation, am decidedly of opinion that the advantage of improving the natural belts of teak which adjoin our plantations, such as the one referred to, is a most useful and important measure with a view to rendering the area as largely consecutive and regularly wooded as possible. The cost of this amounted to Rupees 168-9-0.

Clearing young plants of grass.

84. An attempt was also made to favor the growth of natural teak seedlings by clearing them of grass in the commencement of last rains, over 100,000 were cleared in Byraghur reserve by Mr. Ballantyne, though a number are believed to have subsequently perished, the grass having again risen in such rank profusion as to choke them during the latter months. The failure was probably occasioned by the roots of the grass not being destroyed, and I intended repeating a small experiment, as a great deal of natural reproduction is said to be lost in this way, and if it can be successfully practised it opens to us another method of re-stocking our exhausted forests.

85. In the Southern Division, Mr. Drysdale reports having cleared over 168,000 of Teak and Unjun from grass and rank undergrowth at a cost of Rupees 132-7-0.

Protection from fire.

86. A portion of the Byraghur forest, known as the Raipoor Block, about 30 miles in extent, has for the second season been successfully protected from fire.

87. To effect this a fire path has been cleared all round, except where the river Seepna forms its limit and affords a natural defence. To prevent the possibility of fire reaching it from outside all grass for some distance beyond the fire path was burned in the commencement of the season, and nine Watchers, at Rupees 8 each per mensem, are engaged in patrolling its limits. This is a reduction on last season's establishment.

88. The annual cost of these measures may, therefore, be estimated as follows:—

Cost of clearing ... ... Fire path...	Rupees	175	12	0
Cost of watching ... ... Fire path.	Rupees	472	2	3
Total Rupees...		647	14	3

89. The above comprize all means it is possible to take for this purpose, and though generally they ought to suffice, yet the difficulty of the total exclusion of fire is very great, as a thoroughfare passes through the tract, and it is with the greatest difficulty the Watchers succeed in preventing travellers lighting fires for cooking on their way through. In one portion, however, a fire did break out, though it was extinguished before any damage was done, having only burned a spot of open ground about 600 yards long by 100 yards broad, and as the fire had not entered from outside the reserve, it is supposed to have orginated from the above cause within, unless purposely lighted by an incendiary, though no clue as to its origin could be satisfactorily discovered. No damage being done, however, it is hardly worth naming except as an instance of the difficulty in preventing fires or attaching blame to the originator in such cases.

90. In the Southern Division, Mr. Drysdale reports having made every endeavour to protect Geroo Mattergaon reserve from fire, and favourably mentions the assistance he received from the Deputy Commissioner, Major Allardyce, in carrying out his arrangements. A few fires are stated by him to have broken out, but these were speedily extinguished, the grass, however, in the Buldanah reserves is not, however, of the rank strong growth found in the Mailghât, and fires are therefore more easily kept under.

Beneficial results.

91. Undoubtedly the advantage, to young trees particularly, of the exclusion of fire can hardly be over estimated, instead of their being annually stunted and burnt down until they can make a sufficient shoot in one year to overtop the effects of the flame, they come up as seedlings, and are permitted to make uninterruptedly the annual growth which nature intended, and one cannot fail to be struck by the numerous saplings found struggling through the long grass in the protected tract which the fire must inevitably have killed.

92. Another result should not be forgotten, the long grass which covers the ground and feeds the jungle fires, on being preserved for a number of years annually dies down and rots during the rains, enriching the ground by a thick layer of decayed vegetable matter which is also supplemented by the defoliation of trees.

Effects of Fires.

93. Fire also, when unable to kill the large trees, scorches their bark, burns and kills the seed they have shed, and often damages them to such an extent that they bear signs of the injury ever

afterwads. Whether the advantage derived from the expenditure is sufficient to merit its universal adoption is an undecided question as yet incapable solution, doubtless great benefit to the protected forest must result, but it seems at present impracticable to employ it except on a limited scale. I am informed by Mr. Ballantyne, who has had opportunity of judging of the experiment since its commencement that the increased reproduction in the Raipoor Block is quite remarkable even in two seasons, and though I can only speak for the present, I must say that the number of young plants now visible lead me to judge favorably of the success of the experiment.

94. The damage I have seen wrought by fire in the European forests leads me to the conclusion, that unless, when our forests begin to assume a similar character in containing a regular and closely standing supply of timber, as well as when plantations increase yielding crops of trees at short intervals apart, if fires are not most carefully excluded the effect caused by them will result in the loss of all the labour and money which has been laid out on the portions burned, and therefore though the protected tracts may be limited, it will be impossible to avoid protecting closely growing woods such as I have named without their total ruin.

Plantations.

95. My predecessor in last year's Report described the plantations undertaken in the Seepna valley.

Locality.

96. The locality is a well chosen one, and has been approved by all Forest Officers who have visited it, indeed "Seepna," the name of the stream, is also the Koorkoo for a Teak tree, so that it may be supposed that the district has long been noted for its teak producing powers.

Description.

97. The valley of the Seepna is a long narrow ravine, with steep high hills on either side covered with natural forest, at and above Peelee it may be about a mile broad, below Peelee it gradually opens out, as it joins the Taptee valley.

Plantation sites available.

98. The flats along the course of the river, which is very tortuous, comprise the chief lands available for planting. These are frequently broken by belts of natural grown teak, running down from the hills, especially on the rough grounds, large flat plains intervening between the hills forming the valley, and the sinuosities of the rivers. A consecutive series of plantations can, therefore, be formed for many miles along the banks of the river, the soil and conditions being favourable for 10 miles at least, probably further. There could therefore be no doubt of obtaining a sufficiently large continuous space to meet the requirements adverted to in para. 7 of letter No. 178-F., from the Government of India, Public Works Department, dated 11th March, communicating remarks of the Government of India on this head with reference to last year's annual Report, the letter quoted states that 3,000 acres at least should be available in a continuous block. Although 3,000 acres of land could hardly be found in the narrow valley I have described without interruption, it is believed that fully that amount of land is available for planting in the various flats I have described, the only interruptions being the bed of the river and the belts of natural wood on the rough grounds before referred to.

Teak seed.

99. While adverting to the remarks of the Government of India conveyed in the letter quoted, on the subject of plantations, I would desire permission to remark, that the statement of my predecessor, which is considered erroneous, *viz.*, that teak seed has germinated more readily and freely from being stored for a year prior to sowing, has, in the present year's experience, again proved to be the case, fresh seed and stored seed having been tried in quantity in the same nurseries and precisely under the same conditions, it is found that the stored seed germinates much more freely and in much shorter time

than the fresh seed, and Mr. Ballantyne states that his experience in these forests certainly goes to prove that teak seed does not naturally germinate the year it is shed. The case may be different in Madras and in Burmah, I can however confidently assert that the most striking results are apparent here, while the same fact was remarked by me during my experience in the Central Provinces.

Plantations of 1869-70.

100. The plantations of the past year may be noted as follows :—

1*st*.—Peelee plantation, extent twelve acres, covering a flat situated in a bend of the river soil, strong, rich, dark-red clay, retentive of moisture, planted in the rains 1869. This plantation contains 30,000 plants which continue very healthy and regular, averaging from one to four feet in height.

2*nd*.—At Rakedoh, eight acres prepared by ploughing the seed being sown in rows eight feet apart, seed did not germinate except in rare instances, being however fresh seed, collected the year it was sown, more of it is expected to germinate this rains.

3*rd*.—At the same place five acres of seedlings transplanted from nurseries have done very well. Mr. Ballantyne estimates the deaths at only six per cent.

4*th*.—At Doogiepattie, eleven acres similarly planted have thriven very well, and appear very promising, the soil being the same strong red clay which is so favourable to young teak failures here have been very few.

5*th*.—At Sembadoh, two acres, prepared by ploughing, have come up well, and are in parts so numerous as to admit of removal elsewhere next rains.

Success attained.

101. In the four successful experiments above noted, although in three the plants are small, the one main point which merits particular notice, is, that when once planted out the young plants received no artificial irrigation, and have successfully combated the first hot-weather preserving a healthy appearance, which promises vigorous growth when the rains set in, and that the deaths have been comparatively few.

Remunerative character.

102. The cost of the whole operations of last year amounted to Rupees 684, if beyond this Rupees 100 per annum for clearing the plantations of undergrowth for four years, say 400 Rupees, be calculated additionally, and the average number of trees per acre be taken at 1,000, which would give 30,000 trees over the area planted, there can be no doubt that the plantations when mature will prove remunerative, as the sale of thinnings ought to cover the cost of future operations till the trees arrive at maturity. I now come to notice the preparation for plantations of the year.

Plantation site for the current year selected.

103. A site has been selected in the Seepna valley at Peepulcoota on the north bank of the stream between Peelee and Sembadoh, and work has been proceeding with vigour in preparing the ground in pits to receive the young plants on the outbreak of the rains. The soil is the same dark-red clay, and contained considerable moisture within a foot of the surface in the month of April.

Area of proposed plantation of the current year.

104. It was arranged to plant 200 acres this year at this place, but Mr. Ballantyne states that the labour available is so small that he cannot quite hope to get through so much. I consider the locality one of great promise.

Nurseries.

105. Nurseries have been prepared and sown, in extent of about three-fourth of an acre, and the young plants were just breaking through the earth at the time of my visit in April last in the beds

sown with seed which had been stored, though no appearance was visible in the beds sown with fresh seed, all were equally watered and attended to, and the failure of the fresh seed was very remarkable, though possibly by this time germination may have begun more freely.

Cost during 1870-71

106. The cost of plantations during the past year in Mailghât amounts to Rupees 919-14-6. The details of outlay consist in—

	Rs.	A.	P.
Digging pits and transplanting plantation	509	8	0
Preparing nurseries and watering nurseries ...	154	12	0
Clearing grass	138	5	0
Collecting seed	34	1	6
Re-constructing Forester's hut	76	0	0
Miscellaneous charges	7	4	0
Total...	919	14	6

Oomrawuttee District Plantation.

107. Before leaving the subject of plantations, I must here advert to the plantations carried on in the Oomrawuttee District under the Deputy Commissioner.

108. In last year's annual Report, my predecessor dwelt at some length on the various works in this District which he had arranged with Captain Bell, the Deputy Commissioner, it will therefore be only necessary at present to advert briefly to the various details. I may, however, note that Captain Bell having been obliged to return to England on sick leave, the following remarks are recorded from the report of his successor, Colonel Bushby, and my own observations during my tour of inspection in that District.

Bewapoor Teak Plantation.

109. I first mention the teak plantation at Bewapoor, a small village in the south-east portion of the tract of hills reserved as a district forest, and which was selected for an experiment in teak planting.

Nursery and other work.

110. A nursery was started here in 1868, and last year it was reported to contain 2,000 healthy plants of various sizes, some few exceptions having attained the extraordinary height of 12 feet, the rest were of different heights from 4 inches upwards. In transplanting several were reported by my predecessor to have died. The soil is rich (black cotton) and the seed was received from the Central Provinces, of excellent quality, and I am told that wherever planted it was attended with particularly successful results.

Proposal to take up land.

111. It was also proposed to take up a piece of land adjoining for extension of the operations at a cost of Rupees 125, which was done prior to my arrival in Berar.

Treatment.

112. In this plantation the Deputy Commissioner reports, that about 1,200 Teak seedlings had been successfully transplanted from the nursery and are doing well. In the month of February last, I took an opportunity of visiting this plantation, and found it carefully looked after, and apparently healthy. The only point I thought objectionable in its treatment was that the plants were artificially watered, a most expensive, and at the same time an operation which I consider of doubtful utility, as it stimulates growth during the dry season, which is apparently ordained naturally as a season of requiescence in the vegetable world, similar to the winter in Europe. Apart, however, from the theory of the subject unless, as in our Mailghât plantations, young plants can be reared without artificial watering I much doubt the remunerativeness of the plantation. In the present case the water had been too long artificially supplied to

be stopped until the rains without killing or injuring the young plants; and has therefore been continued. In future operations, however, I propose desiring the Deputy Commissioner to have all trees planted out in the commencement of the rains; and, except in case a long break should occur which is apparently killing the seedlings, to direct that no artificial watering shall be had recourse to. The real success of the experiment will thus be more correctly judged of. The great dearth of wood of all sorts in the Oomrawuttee District makes the success of plantations a matter of great interest. I am, however, inclined to think that the soil is more adapted for the growth of Acacias, like the Babool, than the Teak, which is always found in greatest luxuriance in strong red clay, it being retentive of moisture and not liable to crack with the heat of the sun.

Babool Plantations.

113. The Deputy Commissioner also reports having planted 10 seers of teak seed in the villages of Seonee, Boozoorg and Khoord, and in Cheroree; though the experiment has not been attended with much success.

Dhunnuj.	Hewrah.
Dhanorah.	Jhirgoh.
Azumpoor.	Heerapore.
Naragaon.	

The Babool plantations in the villages marginally noted have also been re-sown during the year under report, and about 25 per cent. had come up, though further germination of the seed sown is expected this monsoon.

Tree Plantation.

114. The plantation proposed by my predecessor in paragraph 77 of last year's annual Report was commenced prior to his leaving Berar, the extent of land is 132 acres which he proposed to plant with Babool and other valuable timber, with a view to supply of wood, as well as general utility to the station of Oomrawuttee, which is particularly destitute of trees. This work has been entirely under the charge of the late Deputy Commissioner, Captain Bell, who took particular interest in its progress.

Progress.

115. During the past year the following operations have been carried out. The land has been fenced in with a hedge and a ditch, and two wells have been sunk for supply of water to nurseries.

Sowings.

116. Twenty seers of teak seed were tried here last monsoon; but, owing to the bad quality of the seed, proved a failure. During the current year 64 seers of seed were sent from Mailghât by Mr. Ballantyne, the Forester; and sown in the commencement of March last, and within a fortnight germination took place, and 5,000 young plants ready to be transplanted on the commencement of the rains are now reported.

Young Trees.

117. In addition to this, 260 young plants of Mango and Mowah have been successfully planted and reared during the past season. One hundred and sixty seers of Babool have also been tried, though they only germinated to the extent of 25 per cent.

Seed procured.

118. A further supply of seed has been sent from Woon District, and more will be forwarded from Mailghât where orders for its collection have been issued.

Bamboo Roots. .

119. A few Bamboo roots sent down from Mailghât by my predecessor have also been tried; though here, as elsewhere, the success has only been partial.

Provision for right of way

120. As a right of way, which it became necessary to provide for, lay through this plantation, a road has been made through it with a culvert over a nullah which is difficult of passage during the rains. The work has been executed by the Deputy Commissioner, who placed it in

charge of the Local Fund Engineer by whom it has been reported nearly complete. The estimated cost of this work amounts to Rupees 3,073, and sanction for transfer of the funds to the correct Budget heading for this purpose was granted in letter No. 5459, dated 6th March 1871. The other expenditure on plantation work in this District amounts to Rupees 3,563-1-4, laid out on the various details above-mentioned.

Endeavour to propagate the Bamboo.

121. During the past year attempts were also made by my predecessor to introduce the Bamboo (by dividing the roots) into various parts of Berar in which it had become nearly extinct. The Districts of Buldanah and Oomrawuttee were supplied with a quantity of roots, some of which I saw during my cold weather's tour: success had in no case been such as to warrant, in my opinion, a repetition of the experiment. In a few places they were alive, where with continued attention and watering they had been able to stand out the effect of the hot dry climate of the plains.

Bamboo Seed distributed.

122. Packets of Bamboo seed were distributed to District Officers for experiment according to the suggestion of the Chief Commissioner, Central Provinces, the results of which have not yet been communicated. Mr. Drysdale informs me of having found the Bamboo growing naturally in Geroo Mattergaon. I have also seen it in the Woon District proposed reserve, but not in any quantity, or of well grown habit. Mailghât is the only forest in which the Bamboo seems to grow freely, and it at present forms one of the chief articles of export.

HEAD I.—SECTION V.

Yield and Working of the Forests.

Timber cut in the State Reserves.

123. The State Forests have during the past year been allowed complete rest, no timber having been supplied from them except to meet a few requirements of private individuals which are too small to merit any particular mention here.

Prospective Timber operations.

124. The extremely exhausted condition of all the State Forests in Berar, would not warrant any large-timber operations in them for many years to come; in fact, except poles and half mature wood, it would be impossible to obtain any valuable teak from them.

Clearing out old stems.

125. The only timber operations which have struck me as being at all likely to be useful and compatible with true conservancy, consist in a careful thinning out of old stems from which young poles are growing at too great a distance from the ground ever to mature into timber.

Description of old stems

126. The stems I advert to are relics of the former times, when persons in want of a pole had no hesitation in meeting their requirement from the upper portion of a standing tree, cutting it 10 and 12 feet from the ground. The stump of course remained and threw out numerous shoots from its upper parts. In the meantime, decay, injuries and fires have gradually eaten away these stems so much, that they frequently have become mere shells, supporting good poles, which, by their weight, gradually break down the old stem, when the annual fires have done their share in the work of its destruction.

Quantity available.

127. Considerable quantities of such stems producing poles have met my eye during my late tour, particularly in Mailghât, and I think it would be advisable to utilize them by cutting the stocks close to the ground, so that they may throw out fresh shoots of a kind that have

some prospect of maturing into timber, as well as by collection and sale of the poles thus obtained. I would, however, strictly limit all felling to old stems bearing poles at some distance from the ground; all wood which has a chance of arriving at maturity as it stands, should in no case be interfered with.

Standing Timber other than Teak.

128. Numerous trees exist both in the State and District Forests, of kinds other than Teak; and I would certainly recommend their being sold and utilized as purchasers come forward; it is, however, a remarkable fact that the general preference for teak is so great that timber of any other kind has little chance of being bought while teak is in the market, even though its price be much higher.

PART I.—HEAD II.

Unreserved or District Forests in the Northern Division.

District Ellichpore.

129. With the exception of the extensive tracts situated in the Mailghât, this District contains no wood lands of any note. There are, however, numerous topes of Mango, Banyan, and other trees, as well as Babool buns, studded over the greater portion of it which is situated in the plains.

Supply of Timber.

130. From the Mailghât, however, the chief supplies of timber, grass, fuel and other forest produce are derived, being taxed at the cordon of nakahs situated along the base of the hills; of these the largest and most productive is Damungaon, six miles from Ellichpore.

Babool Buns.

131. The extent of Babool buns in the district is noted in last year's report, as below:—

	Acres.	
Ellichpore Talook...	2,000	Babool Buns.
	3,040	Scrub jungle.
Durriapore Talook..	560	Babool Buns.
	233	Scrub jungle.

These buns are generally well grown, but young; and will not mature for some years. Some small tracts of scrub jungles also exist, though insufficient for the wants of the people, the richer classes of whom, as before stated, supplement their supplies from Mailghât, the poorer from Neem and other trees more easily obtainable. Any revenue however to be derived from the Talooks of Ellichpore and Durriapoor of this district, which are situated in the plains—except what may hereafter be obtained from Babool buns—must necessarily be very inconsiderable.

132. The Establishment is considered hardly sufficient for the wants of the district, though it appears to have worked satisfactorily during the year.

District Oomrawuttee.

133. In this district the principal tract treated as a district forest is that formerly adverted to, in the hills east of the station, and which supplies grass and firewood to the vicinity, the seigniorage thereon being collected by the District Officer.

No Timber available.

134. No timber is, however, derived from the above tract, which, though it contains a few topes, has long since been de-

nuded of any thing like large timber, the supplies for the District being drawn from the Mailghât, the Central Provinces, and Bombay.

Babool Buns.

135. The district is reported to contain approximately 61 Babool buns of various size and growth. More definite information regarding their size and extent will, however, become available on completion of the survey of the district.

Establishment.

136. The District Officer states that the Darogah and establishment have during the past year performed their duties satisfactorily.

District Akolah.

137. The only portion of this district which can fairly be called district forest extends along its southern boundary, occupying a strip of about 26 miles broad.

General character.

138. The general character of this land is described as rocky and unproductive, Unjun and Tewus being the principal woods produced on it—the former in some quantity: it is also interspersed with pasture lands, and affords a certain amount of timber and fuel to the population, Tewus being used when Teak is not procurable; indeed, the whole timber supply of the district is derived from Mailghât and the Central Provinces on the north, and the tract formerly adverted to on the south; though, as the latter adjoins the forests of the Buldanah and Bassim Districts, it can hardly be supposed to supply more than a portion of the demand. A line of nakahs along the base of the hills, under the Assistant Conservator of Forests, collects seigniorage on forest produce exported from the whole southern range of hills; while that formerly adverted to, along the base of the Mailghât hills, collects duty on all timber and forest produce exported from them. A portion of the timber supply of this district also would, it is presumed, be obtained from Bombay.

Babool Buns.

139. In this district 99 Babool buns exist with an extent of 5,410 acres. I observe that the District Officer appears to question the advantage of retaining these tracts under Babool, as about half the annual rental they would fetch if cultivated, appears to be lost thereby. It must however be considered that no out-turn of timber is as yet placed in the scale in their favor; they are mostly young, and to cut them now for an immediate return, would entail an ultimate sacrifice. Besides, considering the dearth of wood experienced in this district, I consider any judgment against retention of existing crops would be premature, though it will be seen that the weight of his argument has materially influenced my opinion with reference to taking up cultivated land to augment existing Babool buns, adverted to in para. 27 of this Report, regarding the proposed Babool reserves at Loni and in the Purna river. I quote the para. of his Report on this subject.—" There are 99 Babool buns in villages of a total acreage of 5,410, " assessed at Rupees 6,366. That is to say, there are four acres per thousand of " the cultivated area devoted to Babool, at a loss to the State of 35 annas per cent. " of the revenue. On the other hand, the grazing leases in these preserves brought " in Rupees 3,059, leaving a debit of Rupees 3,307 to the department." The District Officer further expresses his satisfaction with the working of his establishment during the past year.

SOUTHERN DIVISION.

District Buldanah.

140. In last year's annual Report my predecessor reported at length the propositions made for reserving certain tracts as district forests in this district. The proposal was subsequently abandoned on account of the quantity of cultivation included by the blocks proposed for this purpose, a house tax or system of commutation having been arranged, by which

the inhabitants were to be allowed to supply themselves with forest produce at the rate of 1 anna per house per mensem, or 12 annas per annum; in addition to which 12 sorts of timber were specially reserved which might be obtained on application to the District Officer at the rates fixed in the special rules framed by my predecessor for this district.

141. The arrangement of compensation has, however, been suspended; and the subject of replacing it by a more suitable one is at present under the consideration of the Commissioners of East and West Berar; as this remark applies equally to the Bassim and Woon Districts, I shall again advert to the subject, confining myself at present to other particulars regarding the district.

Wooded Tracts.

142. The southern or hilly portion of the district belongs to the same category as those of Bassim and Woon; and contains a large quantity of scattered forest land which supplies the people of the district with fuel and other forest produce, a quantity of which is exported to the plains and taxed at the line of nakahs before adverted to under the Assistant Conservator.

Babool Buns.

143. No Babool buns exist in this district, though the tree being one of those specially reserved, it is reported to be increasing rapidly along the banks of the streams. Statistics on this subject however are not available.

Establishment.

144. The Deputy Commissioner reports favourably of the Darogah and establishment; and I quote his remarks as to the general progress of forest management in the district:—" It will be seen from " this report that district forest management in Buldanah has only just begun. " The Deputy Commissioner had no establishment at his disposal till November, " and all that could be done was to insist that the prohibition to fell without per- " mission be closely attended to. Now the question of meeting the requirements " of the people is being met, consideration being had as to the best means of ensur- " ing the growth of good trees by thinning where they are too crowded; and, of the " reserved sorts, it is only these thinnings that are available for purchase."

District Bassim.

145. The character of this district is very similar to that noted regarding the preceding one. During the past year a system for the management of district forests was proposed, 12 kinds of trees being strictly reserved and supplied to the inhabitants at fixed rates under the special arrangements of the District Officer. It was also proposed to apply the system of commutation, formerly mentioned, to this district; though the arrangement has been suspended for re-consideration.

Babool Buns.

146. No Babool buns exist of an extent worth naming, but the tree is classed among the reserved woods. Mowah and Mango, being the only large trees of the district, are frequently asked for as building woods by the more wealthy, though the poorer classes are content with goles of the unrestricted sorts.

Establishment.

147. The District Officer reports that the district establishment have worked satisfactorily and well during the past year.

District Woon.

148. When visiting this district, arrangements, precisely similar to those proposed for Bassim district, were, with the concurrence of the Commissioner and Deputy Commissioner, embodied in a report and submitted for remark through those officers for the Resident's sanction. I regret, however, to state that the report referred to was, as formerly noted, lost in transit, and delay in the arrangements has consequently taken place. In the mean time, however, certain woods are restricted under the Deputy Commissioner's orders; the people being at present, as in the adjoining districts, allowed a free supply of all unreserved sorts of wood and forest produce pending the introduction of further measures.

Babool Buns.

149. Several Babool buns exist in this district, though I regret, the survey being only in progress, more definite details are not yet available.

Establishment.

150. Mr. Lloyd, the District Darogah, is commended by the District Officer for his good service; and the rest of the establishment are reported to have worked well.

Remarks.

151. Before concluding the subject of unreserved or district forests, it remains for me to advert to the system of the collection of forest dues by means of nakahs situated along the base of the Mailghât hills and also those in the Southern Division—the Ajanta range, under the direct agency of the Deputy and Assistant Conservator, respectively.

Bazaars or Nakahs for collection of duty.

152. In referring to the Mailghât nakahs or bazaars, I would note that an increase of the establishment has been made during the year; and a fresh schedule of taxable articles prepared by my predecessor; which were duly sanctioned and introduced on the 20th August 1870. These arrangements have worked satisfactorily, being followed by an increase in the collections of the year amounting to Rupees 13,981-7-2.

153. As details of the above measure have been separately reported upon, I confine myself to the following particulars regarding the timber trade from which the revenue is derived; the produce from which it is sustained, and its future prospects as affected by late restrictions.

Timber trade from Mailghât.

154. The timber trade from the Mailghât was originally to a much greater extent in the hands of the Koorkoos than at present; to meet their circumstances it was arranged that they should be allowed to export timber and forest produce for sale to certain bazaars, and that they should there sell it, the purchaser paying the seigniorage upon it prior to its removal.

155. In the unreserved forests all wood and forest produce was open to be cut and exported to the plains on these terms; and by degrees the trade has become exceedingly popular with Mooltanees, Bunjarees, and other races, the chief articles of export being Teak and Bamboos. So long as Teak was available other timber was never touched; and latterly the bazaars were filled with young saplings in quantities from about six and eight to two inches in diameter.

156. The excessive wastefulness of this practice could not fail to be apparent; and the felling of Teak, Tewus, and Sheshum have been restricted throughout the Mailghât by order of the Resident on my representation.

157. Many other kinds of wood still remain for supply of the plains, but means for the supply of a proportion of Teak are at present under consideration, and will form the subject of separate correspondence.

158. In referring to this point, however, I must beg to bring prominently to notice, that though the necessity for the measure reported was of the greatest urgency, and delay would have rendered it more difficult to deal with, it will affect the annual income of the bazaars during the next year to a considerable extent: my private opinion on this subject, however, founded on personal observation, is, that the forests had already suffered to such an extent, that, whether the measure had been introduced or not, the decrease in revenue could not be avoided, the unreserved portion of Mailghât having been so thoroughly denuded of young Teak that supply of the markets had become impossible.

Nakahs in Southern Division.

159. The institution during the past year of a line of nakahs along the hills in the Southern Division under the Assistant Conservator has also been mentioned. These nakahs may be said to collect

seigniorage on the produce of the parts of Buldana, Bassim, and Akolah Districts which are situated among the hills, prior to its export to the plains. Duty has been collected here on fuel, grass, timber, &c., at the rates sanctioned in *Residency Orders*. They are reported to have worked well during the past season; and have produced a net revenue, after payment of the establishment, of Rupees 2,367-1-10.

District Revenue.

160. It will thus be seen that the chief unreserved forests of Berar are confined to the Mailghât on the north, and the hill districts in the southern division: the produce of each is taxed at the nakahs before reaching the plains; and the system of taxation and administration of the district forests to be introduced into the three southern districts to provide for a return of revenue on account of their own consumption of forest produce, is the chief point of importance remaining under adjustment. The results of my endeavours to attain this object therefore, will more appropriately form the subject of separate correspondence; though, in concluding my remarks, I would beg to observe that the anticipated decrease of income already mentioned in the Mailghât should render the subject one of more than ordinary importance; and, while endeavouring to obtain a full return of income from all fair sources, the avoidance of unduly burdening the poorer classes of consumers will not, I trust, be lost sight of.

HEAD III.

Village and Private Forests.

161. Under this head, in addition to certain small tracts named by District Officers, I would note the Izarah tenures or clearance leases, which, in the Woon and Bassim Districts, have caused much inconvenience in selecting forest reserves, and the procedure regarding which is now a point of reference in the Bassim District. As these have however been adverted to by my predecessor at length in last year's annual Report, I need not recapitulate his remarks. The subject of restriction in the grant of these leases is, however, now before the Resident, and will, I trust, prevent the recurrence of former errors.

162. Beyond the above noted, and in most cases, I should think, of less size and importance, may be classed the several Jagheers, Inam, and Mafee holdings, which exist in the various districts of Berar; as well as the few Babool buns belonging to villagers. None of these, however, appear worthy of particular note as private forests.

PART II.—GENERAL.

Financial results.

163. The financial results of the year 1870-71 are detailed in the prescribed forms Nos. 21 to 28, which accompany this Report, and regarding which I beg to offer the following remarks.

Form No. 21.

164. This form exhibits in detail the receipts and charges for the year under review, which, as shown below, contrast favourably with those of the preceding year. I would explain, however, that I have taken the figures for the year 1869-70 from the annual Report of that year submitted by my predecessor, adding to the charges Rupees 17,119-12-2, being compensation to Mailghât Rajahs not included in them. The figures then stand as follows:—

	Receipts.				*Charges.*		
	RS.	A.	P.		RS.	A.	P.
1870-71	1,77,279	3	3	...	82,057	7	5
1869-70	1,41,788	11	3	...	77,068	3	7
Increase...	35,490	8	0	...	4,989	3	10

165. An increase in revenue, and also in expenditure, is thus apparent. The former, being due to the greater consumption of forest produce, and improved measures for taxation of the produce of unreserved forests, amounts to Rupees 35,490-8-0. The latter is chiefly due to expenditure on extra establishments for collection of the dues above referred to, and amounts to Rupees 4,989-3-10.

Form No. 22.

166. This exhibits the annual Abstract Account of the cash transactions of the Department during the past year, and I merely note the following items with reference to which explanation may be desirable.

167. The cash balance brought forward, exhibits the figures shown by my predecessor, which I retain unaltered, as I have not yet received their final corrections from the Deputy Accountant General.

168. The item Remittances to State Treasuries Rupees 70,889-7-1. Northern Division, includes Rupees 17,119-12-2—the amount sanctioned by the Resident as compensation to be paid to Mailghât Rajahs by the Forest Department. This payment has been made by transfer through the Deputy Accountant General; not by cheque.

169. The same amount is also included in the expenditure of the Northern Division, Rupees 66,339-0-7.

170. No further items in this account appear to require explanation.

Form No. 23.

171. Advances to contractors or disbursers. In addition to the transactions of the year under review, this form contains an item of Rupees 23,012-11-2, being the outstanding balance due by contractors on account of purchase of contracts for collection of seigniorage, and are unadjusted balances of revenue brought forward from previous years.

172. During the year under review a recovery of Rupees 2,884-4-4 from Chimmunsha Ruttunsha has taken place, leaving an irrecoverable balance of Rupees 280-13-8 due on his account; in addition to which, Rupees 704 and Rupees 194 have been written off the accounts of the Department on due sanction.

173. The claims of Bapoojee, Dewajee, and Kalooram, still remain outstanding; but as the final settlement of these outstandings will form the subject of a separate report, no further remarks seems requisite.

Form No. 24.

174. Exhibits timber brought on stock during the past year.

Form No 25.

175. Exhibits the receipts and expenditure of timber stock during the year 1870-71, with the balance of timber on hand, and the rates at which it has been estimated.

176. With reference to the valuation of timber stock remaining on hand at the end of the year, it appears necessary to remark that the whole of this wood consists either of poles and small wood, or remnants and pieces, of comparatively little value. As regards the former, cubic measurement would be inappropriate, and the latter, being as a rule of inferior quality and different descriptions, I consider valuation by measurement would probably lead to fallacious results—much of the wood being deeply cracked and consequently unsound. I have, therefore, adopted the low valuation by pieces noted at the foot of this Form—which I think cannot fail to be realized—in preference to any more elaborate calculation, from which, the inferior nature of the timber, precludes hope of more accurate results.

Forms Nos. 26 and 27.

177. Appear to require no special remark, being merely details explanatory of Forms Nos. 21 and 25.

Form No. 28.

178. Exhibits in lump the receipts, charges, assets and liabilities of the year under review, showing a net revenue in favor of the Department amounting to Rupees 95,817-11-2. If from the figures shown in this Form for the preceding year, Rupees 17,119-12-2—the compensation to Mailghât Rajahs—be deducted, a balance of Rupees 66,855-7-10 remains, in comparison with which, the results of the year now reported on exhibit an increase of Rupees 28,962-3-4 in favour of the Department.

PART II.—GENERAL.

179. Before concluding this Report it remains for me to notice a few points of a general character which have not as yet been adverted to.

Office Establishment of Assistant Conservator.

180. Up to this time the accounts of both the Northern and Southern Divisions have been kept in the Office of the Deputy Conservator. Consequently, however, on the increase of work in the Department, and with a view to a better system of controul and arrangement of the Divisional work, application has been made for an Office Establishment for the Assistant Conservator, which it is expected will receive an early sanction.

Quarters for Forest Officers.

181. In conformity with the suggestion of the Inspector General of Forests, the head-quarters of the Northern Forest Division have been fixed at Chickulda; Bassim having been selected as the most favourable residence for the Forest Officer of the Southern Division.

182. At Chickulda the necessary house accommodation has been purchased under the Resident's orders; and certain repairs which were absolutely necessary to render the buildings habitable during the rains, have been executed in a permanent manner.

183. The Assistant Conservator has been desired to submit a plan and estimate for a building for his head-quarters and office at Bassim in communication with the Assistant Engineer.

Labour Supply.

184. The Mailghât is the only portion of Berar where difficulty in procuring a sufficiency of labour is experienced. During the past year the labour available has generally been found adequate except on the occasion of native festivals, and at the time of sowing or taking in the crops, when the Koorkoos leave the works to attend to their fields. It is however most remarkable that no persuasion will induce them to work on their feasts and holidays which are devoted exclusively to festivity.

General Health of the Establishment.

185. The Mailghât is the only portion of Berar that appears to deserve notice as a particularly unhealthy locality. In other Districts cases of illness frequently occur from the exposure entailed by forest work, but the Mailghât Establishment is scarcely ever without some of its number more or less seriously laid up. The principal ailments are fever, ague, enlargement of the spleen and dysentery, which are specially prevalent after the rains in the months of September, October, November, and December. I therefore found it desirable to employ the European Forester in more healthy localities during these months, though I regret to say that, even in the more healthy portion of the year, he does not escape without repeated attacks of fever.

Distribution of Medicines.

186. I have, however, with the Resident's sanction obtained a supply of medicines which have been distributed to the Forest Establishments located at a distance from medical aid, and trust by that means to prevent their being continually disabled and obliged to leave their posts.

Acknowledgments to Commissioners and other District Officers.

187. My best thanks and acknowledgments are due to the Commissioners of East and West Berar for the cordial manner in which they have interested themselves in the progress of the various Forest arrangements which have been laid before them during the past year: also, to the Superintendent Revenue Survey, and the several District Officers throughout Berar, who have, each and all, readily co-operated in forwarding my views.

Services of Forest Officers.

188. Mr. Drysdale, the Assistant Conservator, has also done much good and valuable service. He has been employed at the commencement of the year in organizing and arranging a line of nakahs in the Buldanah and Akolah Districts: he afterwards accompanied me in visiting the Babool tracts in Akolah and the other forests in the Southern Division which have been selected as State reserves; and lastly in the demarcation of the Geroo Mattergaon Forest. I would therefore here express my entire satisfaction with his work, and with the ability with which he has carried on his duties generally during the past year.

189. Mr. Ballantyne, the Forester, has also worked very hard and diligently: he remained at his plantations at Peelee until the rains were far advanced, the season being a most important one for plantation work. I have already expressed my approval of the successful result he has shown; and I consider his zeal, and the intelligent manner in which he has carried on the various works entrusted to his supervision, as deserving the highest commendation I can bestow.

190. Among the native subordinates of the Department, I mention the District Darogah of Oomrawuttee, Russool Khan, as having kept up the high character formerly earned by him under my predecessor and the Deputy Commissioner. Others in the Department have undoubtedly done well, but their services do not seem deserving of special notice.

Conclusion.

191. In concluding this Report I trust that, if the amount of work actually carried out may appear small, it will be remembered that having received charge of this appointment in the end of September, the chief portion of my time has necessarily been spent in visiting and acquainting myself with the various districts and localities in which Forest work lay; and with this view I have passed through every District in Berar, except Buldanah, which I expect to visit shortly; and I would therefore hope that, all things considered, the results of the past year may not be deemed unsatisfactory.

APPENDIX A.

DEMARCATION OF STATE RESERVES.

All State Reserves should be demarcated by a boundary path 40 feet in breadth.

2. This path should be kept as straight as possible, and curves as a rule avoided, the boundary lines meeting in angles at various points; the fewer angles however the better.

3. A row of boundary posts to be erected in the centre of the path, and their positions should be one at each angle. Where, however, the boundary forms a continuous straight line they may be placed about a mile apart, or such distance as they can be conveniently seen one from the other.

4. These posts shall receive a serial number in each reserve. The numbers should be prepared according to an established pattern, of which a specimen will be retained in this Office. It shall consist of two sheets of tin, as per margin, which shall be placed one above the other and nailed by two nails to the boundary post A. A., the number B. shall be cut out on the upper sheet of tin and the lower sheet of tin will then show through. The upper sheet of tin to be painted white, the lower red. A red number will thus appear on a white ground. This device has been fixed on, as any Forest Watcher can renew the paint accurately without the assistance of a professional painter which might be difficult to obtain.

5. The boundary posts will consist of a strong pole not less than inches in diameter, and 9 feet above the ground level, placed perpendicularly in a heap of stones and sunk at least 18 inches in the ground. The total length of the pole will thus be 10 feet 6 inches. The heap of stones to have a base 8 feet wide by 4 feet in height, and the top of the pole to be capped by a gurra or chatty whitewashed. It will then present an appearance as per margin. The serial number of the post to face inwards.

6. A monthly report to be forwarded with the accounts of each demarcated forest, stating that the posts have been inspected and are all correct. Repairs to be made as required by the Officer in charge, and reported to this office monthly in the report above alluded to, the charge being shown in the monthly accounts.

7. Where stones are not procurable a heap of clay or mud will be substituted and kept in repair as being the least expensive substitute.

8. This demarcation is in accordance with the Inspector General of Forests' Report No. 90, to the First Assistant Resident, dated Camp Jubbulpore, 21st April 1869.

APPENDIX B.

LIST OF PERMANENT AND TEMPORARY ESTABLISHMENTS.

PERMANENT.

NORTHERN DIVISION.

Controlling Establishment.

		Rs.	A.	P.
1	Deputy Conservator of Forests, 2nd Grade	700	0	0

Office Establishment.

		Rs.	A.	P.			
1	English Clerk	75	0	0			
1	Do.	50	0	0			
1	Karkoon	25	0	0			
1	Do.	20	0	0			
2	Orderly Peons, at 6 each	12	0	0			
1	Native Doctor	50	0	0			
					232	0	0

Conservancy Establishment.

Mailghât.

		Rs.	A.	P.			
1	Scotch Forester	200	0	0			
1	Darogah, 2nd Class...	70	0	0			
1	Jemadar, 1st Class...	35	0	0			
2	Do., 2nd Class, at 25 each	50	0	0			
3	Watchers, 1st Class, at 15 each	45	0	0			
3	Do., 2nd Class, at 12 each	36	0	0			
12	Do., 3rd Class, at 8 each	96	0	0			
					532	0	0

Oomrawuttee District.

		Rs.	A.	P.			
1	Darogah, 1st Class	80	0	0			
1	Watcher, 1st Class	15	0	0			
3	Do., 2nd Class, at 12 each	36	0	0			
1	Do., 3rd Class	8	0	0			
					139	0	0
	Carried over...				1,603	0	0

						Rs.	A.	P.
					Brought forward...	1,603	0	0

Ellichpore District.

				Rs.	A.	P.	Rs.	A.	P.
1	Watcher, 1st Class ..	...	...	15	0	0			
1	Do., 2nd Class ..	...	...	12	0	0			
1	Do., 3rd Class ...	...	...	8	0	0			
							35	0	0

Akolah District.

				Rs.	A.	P.	Rs.	A.	P.
1	Darogah, 4th Class ...	...	...	50	0	0			
1	Watcher, 1st Class ...	...	...	15	0	0			
3	Do., 2nd Class, at 12 each	...	...	36	0	0			
1	Do., 3rd Class ...	...	...	8	0	0			
							109	0	0
					Total Northern Division ...		1,747	0	0

SOUTHERN DIVISION.

Controlling Establishment.

1	Assistant Conservator of Forests ...	...	...				400	0	0

Office Establishment.

				Rs.	A.	P.	Rs.	A.	P.
1	Karkoon ...	...	...	25	0	0			
2	Orderly Peons, at 6 each	...	...	12	0	0			
							37	0	0

Booldanah District.

				Rs.	A.	P.	Rs.	A.	P.
1	Darogah, 4th Class ..	...	...	50	0	0			
1	Watcher ...	...	...	12	0	0			
2	Do., at 8 each ...	...	...	16	0	0			
1	Do. ...	...	...	7	0	0			
							85	0	0

Bassim District.

				Rs.	A.	P.	Rs.	A.	P.
1	Watcher, 1st Class...	...	...	15	0	0			
2	Do., 2nd Class, at 12 each	...	...	24	0	0			
1	Do., 3rd Class...	...	...	8	0	0			
							47	0	0

Woon District.

				Rs.	A.	P.	Rs.	A.	P.
1	Darogah, 3rd Class...	...	...	60	0	0			
2	Watchers, 1st Class...	...	...	30	0	0			
3	Do., 2nd Class...	...	...	36	0	0			
1	Do., 3rd Class...	...	...	8	0	0			
							134	0	0
					Total Southern Division ...		703	0	0
					Total of Permanent Establishment ...		2,450	0	0

TEMPORARY.

Oomrawuttee District.

		Rs.	A.	P.	Rs.	A.	P.
2	Watchers, 2nd Class, at 12 each	24	0	0			
10	Do., 3rd Class, at 8 each	80	0	0			
					104	0	0

MAILGHAT.

Nakah or Bazaar Establishment.

		Rs.	A.	P.			
1	Inspector	90	0	0			
1	Karkoon	25	0	0			
2	Do., at 20 each	40	0	0			
10	Do., at 15 each	150	0	0			
1	Do.	10	0	0			
28	Peons, at 7 each	196	0	0			
					511	0	0

Grazing Establishment.

		Rs.	A.	P.			
2	Karkoons, at 25 each	50	0	0			
2	Peons, at 8 each	16	0	0			
					66	0	0

Office Establishment.

		Rs.	A.	P.			
1	Sweeper for Hospital	7	0	0			
					7	0	0

Treasury Guard.

		Rs.	A.	P.			
1	Duffadar	10	0	0			
4	Constables, at 7 each	28	0	0			
					38	0	0

Nakah Establishment in the Akolah and Buldanah Districts.

		Rs.	A.	P.			
9	Karkoons, at 15 each	135	0	0			
10	Peons, at 7 each	70	0	0			
					205	0	0

Buldanah State Reserve Establishment.

		Rs.	A.	P.			
1	Darogah, 4th Class	50	0	0			
2	Watchers, 1st Class, at 15 each	30	0	0			
2	Do., 2nd Class, at 12 each	24	0	0			
2	Do., 3rd Class, at 8 each	16	0	0			
					120	0	0
	Total of Temporary Establishment...				1,051	0	0

APPENDIX C.

List of Forest Offences tried before the Magistrate during the year 1870-71, *under the Forest Act VII. of* 1865.

Districts.	No. of Cases.	No. of Persons.	Convicted.	Left off.	Tried and fines credited to Forest Department.			Tried and fines credited to Civil Departments.			Remarks.
					RS.	A.	P.	RS.	A.	P.	
Ellichpore	...	...	...	...	...	...	...	...	...	..	
Oomrawuttee	...	...	...	...	...	...	...	...	...	...	
Woon	...	...	...	...	...	...	...	...	...	...	
Bassim	9	15	13	2	10	0	0	176	0	0	
Akolah	*1	1	1	...	...	...	...	3	0	0	* Under Section 21 of the Forest Rules
Buldanah	5	87	87	.	95	15	8	...	...	...	None of these cases were tried under the Forest Act No. VII. of 1865, but under the Forest Rules.

FORM NO. 21.

FOREST DEPARTMENT—BERAR.

Annual Summary of Revenue and Expenditure of the different Divisions during 1870-71.

	Northern Division.															Southern Division.															Grand Total.		
	Melghat.			Ellichpore District.			Oomrawuttee District.			Akolah District.			Total.			Assistant Conservator of Forests.			Buldanah District.			Woon District.			Bassim District.			Total.					
RECEIPTS.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
I.—Sale of timber brought to Depôts by Government Agency	2,549	2	7	...	...	...	...	...	...	...	...	...	2,549	2	7	56	0	0	426	6	11	1,350	5	5	679	5	1	2,512	1	5	5,061	4	0
II.—Sale of timber, firewood, bamboos, and charcoal removed from the Forests by purchasers, including seigniorage	...	..	...	887	7	11	2,420	12	3	1,366	7	8	4,674	11	10	113	14	3	204	15	6	15	12	3	264	14	3	599	8	3	5,274	4	1
III.—Duty on foreign timber	2,296	5	1	...	...	..	1,904	13	0	...	...	...	4,201	2	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4,201	2	1
IV.—Permit fees and rent of jungles and privileges	1,05,530 *1,719	0 13	10 9	...	...	...	758	7	6	...	...	...	1,08,008	6	1	1,723	10	0	2,597	7	4	...	...	...	44	7	0	4,365	8	4	1,12,373	14	5
V.—Grazing dues	6,510	11	3	391	0	0	17,888	5	1	1,476	7	4	26,266	7	8	...	...	...	4,280	11	6	...	...	...	...	...	...	4,280	11	6	30,547	3	2
VI.—Sale of fruits, babool pods, and other minor forest produce	...	..	...	545	6	0	16,780	8	3	...	...	...	17,325	14	3	...	...	...	31	0	0	...	...	...	...	...	...	31	0	0	17,356	14	3
VII.—Sale of confiscated drift and waif timber	276	6	9	20	9	0	20	13	6	0	1	0	317	14	3	...	...	...	293	7	3	...	...	...	...	...	...	293	7	3	611	5	6
VIII.—Fines and forfeitures	...	...	.	8	0	0	...	...	...	...	...	...	8	0	0	12	14	1	39	5	9	1	13	11	...	...	...	54	1	9	62	1	9
IX.—Miscellaneous receipts	299	15	2	293	2	3	691	8	3	237	1	1	1,521	10	9	194	12	6	9	10	0	25	8	0	39	8	9	269	7	3	1,791	2	0
Total Receipts...	1,19,182	7	5	2,145	9	2	40,465	3	10	3,080	1	1	1,64,873	5	6	2,101	2	10	7,883	0	3	1,393	7	7	1,028	3	1	12,405	13	9	1,77,279	3	3
EXPENDITURE.																																	
A.—Conservancy and Working.																																	
I.—Timber expenses for felling, cutting, clearing, sawing, and the transport of timber by land or water to depots; also charges for storing, securing, watching, piling, and arrangements for selling timber	56	0	0	...	...	...	...	...	...	...	...	...	56	0	0	...	...	...	14	8	0	332	5	6	...	...	..	346	13	6	402	13	6
II.—Purchase of Elephants, cattle, and dead stock, tools, and plant ...	1,733	9	3	...	...	...	79	8	0	...	...	...	1,813	1	3	32	9	0	...	...	...	3	0	0	...	...	...	35	9	0	1,848	10	3
III.—Feed and keep of Elephant and cattle	2,220	1	7	...	...	...	...	...	...	...	...	...	2,220	1	7	632	8	3	...	...	...	...	...	...	...	...	...	632	8	3	2,852	9	10

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FORM No. 22.

FOREST DEPARTMENT—BERAR.

Annual Abstract Account of the Cash Transactions of the Forest Department in Berar.

Year.	Heads of Account.		Rupees. Rs.	A.	P.	Total. Rs.	A.	P.
1870-71.	Cash balance on the 1st April 1870 ...	Northern Division.	3,569	2	9			
		Southern do.	155	9	6	3,724	12	3
	Revenue received during the year	Northern do.	1,61,539	8	8			
		Southern do.	12,187	7	4	1,73,727	0	0
	Outstanding revenue recovered on account of former years ...	Northern do.	2,884	4	4	2,884	4	4
	To remittances from State Treasuries	Northern do.	70,889	7	1			
		Southern do.	16,626	9	0	87,516	0	1
	To advances recovered..	Northern do.	9,196	3	10			
		Southern do.	662	1	1	9,858	4	11
	To retrenchments recovered	Northern do.	0	1	2			
		Southern do.	144	0	0	144	1	2
	To deposits received		...	...	...			
	GOVERNMENT OF INDIA.							
	Income Tax	Northern Division.	448	10	3			
		Southern do.	195	11	0			
	Stamp fees recovered from Captain W. Douglas 15-0-0		15	0	0	659	5	3
	GOVERNMENT OF MADRAS.							
	Captain Douglas' subscription to Military Fund		121	10	1	121	10	1
	GOVERNMENT OF CENTRAL PROVINCES.							
	Recovered from Captain Douglas in adjustment of advance Rs. 600. made to him by the Conservator of Forests, Central Provinces.		60	6	7	60	6	7
	Grand Total Rupees...		...	...	...	2,78,695	12	8

Year.	Heads of Account.		Rupees. Rs.	A.	P.	Total. Rs.	A.	P.
1870-71.	By expenditure of the Department ...	Northern Division.	66,339	0	7			
		Southern do.	15,718	6	10	82,057	7	5
	„ Advances made ...	Northern do.	15,338	5	4			
		Southern do.	672	4	0	16,010	9	4
	„ Remittances to State Treasuries ...	Northern do.	1,64,873	5	6			
		Southern do.	12,405	13	9	1,77,279	3	3
	„ Re-payments of deposits		...	...	...			
	„ Refund of revenue...	Southern Division.	50	0	0	50	0	0
	„ By cancelled Cheques		437	0	0	437	0	0
	GOVERNMENT OF INDIA.							
	Income Tax and Stamp Fees paid into the Treasuries	Northern Division.	463	10	3			
		Southern do.	194	2	0	657	12	3
	GOVERNMENT OF MADRAS.							
	Captain Douglas' subscription paid into the Treasuries		121	10	1	121	10	1
	GOVERNMENT OF CENTRAL PROVINCES.							
	Refund of Captain Douglas' advance ...		60	6	7	60	6	7
	Cash balance on the 31st March 1871 ...	Northern Division.	1,953	9	9			
		Southern do.	68	2	0	2,021	11	9
	Grand Total Rupees...		...	...	...	2,78,695	12	8

FORM No. 23.

FOREST DEPARTMENT—BERAR.

Annual Statement of Outstandings and Liabilities of the Department on account of Contractors and Disbursers.

DIVISION.		Department—Debtor. At commencement of year.	Department—Debtor. Recoveries in cash and value of supplies and work done during year.	Department—Debtor. At close of year.	Department—Creditor. At commencement of year.	Department—Creditor. Payments made during year.	Department—Creditor. At close of year.	Balance Due. To Department, (outstandings.)	Balance Due. By Department (liabilities.)
			RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	
Northern Division, on account of sale of Contracts.	Kalooram	.....	.....	.....	2,469 7 0	.....	2,469 7 0	2,469 7 0	.....
	Bapoojee Dewajee	.....	.....	.....	15,130 2 2	.....	15,130 2 2	15,130 2 2	.....
	Chimmunsha Ruttonsha ...	.....	* 2,884 4 4	2,884 4 4	3,165 2 0	.....	3,165 2 0	280 13 8	.....
	Sonajee Sukkaram	.....	† 704 0 0	704 0 0	704 0 0	.....	704 0 0	.....	.....
	Sukkaram Gunesh	.....	.....	.....	‡ 1,350 0 0	.....	1,350 0 0	1,350 0 0	.....
	Beemsing	.....	† 194 0 0	194 0 0	194 0 0	.....	194 0 0	.....	.....
	Total...	.....	3,782 4 4	3,782 4 4	23,012 11 2	.....	23,012 11 2	19,230 6 10	.....
On account of Contractor Disburser's Ledger.	Northern Division.	.....	9,196 3 10	9,196 3 10	§ 662 11 8	15,338 5 4	16,001 1 0	6,804 13 2	.....
	Southern do.	.....	662 1 1	662 1 1	775 10 0	672 4 0	1,447 14 0	785 12 11	.....
	Grand Total Rupees ..	.....	13,640 9 3	13,640 9 3	24,451 0 10	16,010 9 4	40,461 10 2	26,821 0 11	.....

* Recovered in Cash.

† Written off to Profit and Loss, under the authority conveyed in Deputy Accountant General's letter, No 656, dated 19th May 1871.

‡ Rupees 1,485 have been sanctioned to be written off to Profit and Loss on this account. The increased amount being due to interest claimed on preferring the suit.

§ Rupees 40 a balance in the hands of the Deputy Commissioner, Oomrawuttee, appears to have been omitted in last year's outstanding balance. The amou t outstanding at commencement of the year is now increased by that sum.

FORM No. 24.

FOREST DEPARTMENT—BERAR.

Statement of Timber brought to Depôts from the different Forest Divisions during the year 1870-71.

Name of River or Division.	Forest.	Description of Timber.	Pieces.	Cubic feet.	Total of each River. Pieces.	Total of each River. Cubic Feet.	Remarks.
Northern Division.	Byraghur...	Teak curies ...	18	...	...	...	
	Do. ...	Teak goles ...	58	...	..	...	
	Do. ...	Tewus goles ...	2	...	78	...	
Southern Division.	Patroat ...	Teak remnants collected ..	4,910	...	...	...	
	Booldana....	Teak, Unjun, and Tewus poles..	8,875	...	13,785	...	
		Total Pieces ...	...	...	13,863	...	

FORM No 25.

FOREST DEPARTMENT—BERAR.

Annual Timber Account for 1870-71.

Particulars.	Pieces.	Total.	Particulars.	Pieces.	Total.
I.—Stock in hand at the following Depôts at the commencement of the year:—			I.—Timber removed by purchasers from Depôts ...	10,820	
Jheerie - - - - 948			II.—Timber lost . . .	...	
Peelie - - - - 746			III.—Stock in hand at the close of the year at the following Depôts:—		
Damangaon - - 115			Jheerie - - - - - 411		
Booldana . - - - 5,797	7,606		Peelie - - - - - 83		
			Chiculda - - - - - 58		
			Booldana - - - - - 5,682		
			Patroat—Woon - - 4,415	10,649	
II.—Timber received at Depôts from the Forests:—					
Northern Division... 78					
Southern Division... 13,785	13,863				
Total Pieces ...	21,469		Total Pieces ...	21,469	

Abstract of Stock in hand at the close of the year 1870-71, *estimated as follows*:—

				Rs.	A.	P.
Jheerie ...	...	...	411 at 1 Rupee ...	411	0	0
Peelie ...	...	...	83 at 8 Annas ...	41	8	0
Chiculda ...	...	...	58 at 2 Rupees ...	116	0	0
Patroat, ...	...	...	269 at 1 Rupee each	269	0	0
Woon. ...	...	...	4,146 Pieces	500	0	0
Booldana ...	...	...	5,682 at 10 Rs. per 100	568	0	0
			Total ...	1,905	8	0

FORM No. 26.

FOREST DEPARTMENT—BERAR.

Statement showing the amount realized on account of the different classes of Timber sold during 1870-71.

Divisions.	Number of Logs sold.	Cubical contents.	Amount realized and due on account of Timber sold.	Average amount per Log.	Average cubical contents of Logs.	Average amount per 100 cubic feet.	Remarks.
	Pieces.		RS. A. P.	RS. A. P.			
Northern Division	1,335	.....	2,001 4 3	1 8 0	.....	.....	
Southern do.	9,485	.....	1,290 8 11	0 2 2	.....	.....	
Total...	10,820	.....	3,291 13 2	0 4 10	.....	.....	
DEDUCT—							
Amount due but not realized during the year			191 0 0				
Balance...			3,100 13 2				
ADD—							
Amount realized on account of former years			587 14 4				
* Amount collected by the Assistant Conservator during 1870-71.			56 0 0				
* Do. by Civil Officers during 1870-71			1,316 8 6				
Total shown as Revenue on account of Timber sales			5,061 4 0				

* Poles and small remnants. Number of pieces not exactly known.

FORM No. 27.

FOREST DEPARTMENT—BERAR.

Statement showing the amount expended on account of Timber received from the different Forest Divisions during 1870-71.

Name of Division.	No. of Logs.	Cubical contents.	Timber expenses.	Conservancy expenses, cost of Establishment, &c., of the Department, excluding Direction.	Total amount expended, including Direction.	Average amount paid per log.	Average cubic contents per log.	Average amount paid per 100 cubic feet.	Remarks.
			RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.			
Northern Division ...	78	...	56 0 0	.....	56 0 0	0 11 6	.....	*...	
Southern Division ...	13,785	...	346 13 6	3,197 6 8	3,544 4 2	0 4 1	.....	†...	
Total...	13,863	...	402 13 6	3,197 6 8	3,600 4 2	0 4 2	...	...	
Add—Direction Charges.	...	...	.....	.....	.....	.....	.....	...	
Grand Total.	13,863	...	402 13 6	3,197 6 8	3,600 4 2	0 4 2	.....	...	

Abstract rates per 100 cubic feet.

	1870-71.	1871-71.
Timber expenses, Conservancy and Establishment ...		
Direction ...		
Total...		

*The amount of timber felled is too small to bear any debit for Establishment, no part of which was entertained especially to fell or to protect it.

†This timber having been cut and collected through District Officers of Woon and Bookana, the cost of the District establishment has been added to timber expenses.

FORM No. 28.

FOREST DEPARTMENT—BERAR.

Annual Account of Forest Revenue for the year 1870-71.

	Rs.	A.	P.
Receipts	1,77,279	3	3
Expenditure	82,057	7	5
Surplus or Deficit.....	95,221	11	10
Add (or subtract) difference between Assets and Liabilities at the commencement and close of the year...	595	15	4
Net Revenue.....	95,817	11	2

NOTE.—Besides the above sums, which show the actual transactions on timber brought into the Depôts, the value of timber in various states, in the forests, and in transit may be approximately estimated at Rupees———.

Detail of difference between Assets and Liabilities at the commencement and close of the year.

	At the commencement of the year.			At the close of the year.			Difference. In favour of the year.			Difference. Against the year.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Value of timber and other stock	3,679	8	9	1,905	8	0	.....			1,774	0	9
Outstanding on account of sales and excess payment to Contractors.	24,451	0	10	26,821	0	11	2,370	0	1	.....		
Total Assets...	28,130	9	7	28,726	8	11	2,370	0	1	1,774	0	9
Deduct Liabilities...	.....			.....			1,774	0	9	.....		
Balance ..	.....			.....			595	15	4	.....		